Amateur Radio

VOL 54, No 1, JANUARY 1986

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

THE PAST

THE PRESENT

?

THE FUTURE

The Australian Electronics Monthly

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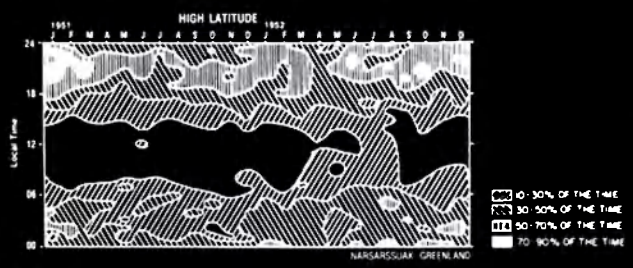

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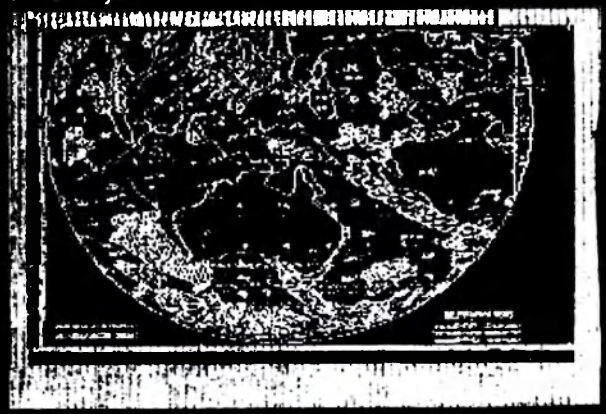

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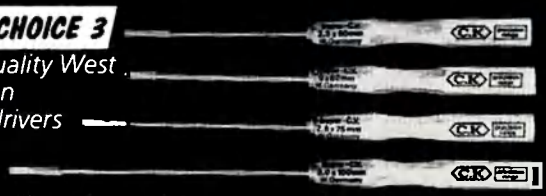

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Amateur Radio

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To commence the New Year, Amateur Radio has a full and varied range of articles — many technical, some newsy, some humourous and a little history, their is even an article from the industrious editor. Bill explains the whys and wherefores of FM Detectors, page 17.

Included in Amateur Radio this month is another 12 months Planner Calendar. This year it includes many historic occasions from the past and the births and deaths of many famous names, and some not so famous, yet all have achieved some degree of notoriety. It is hoped these entries will be a talking-point for members on-air — did you know that such-and-such happened today? Or who was so-and-so, and what did he achieve? It may mean bringing out the history books to find some more information, as it is only possible to whet-ones-whistle on a calendar!

The Main QSP reviews the background of Band Planning and explains the necessity for it, page 3, whilst WIA News explains the updates to Phone Patching, page 5.

Following on from the 75th Year, there is the address delivered by Richard Butler, Secretary-General of the ITU, to the Anniversary Dinner, page 5, and a volunteer sightseeing bus driver shares his experiences with readers, page 42. Also, the winners of the National Fox Hunt and the RTTY ArtContest are published.

Following on from the Editorial in November's magazine, the first list of amateurs who have been members of the Institute for 50 years or more, are published, page 57.

DEADLINE

All copy for inclusion in the March 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st January 1986.

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HAMADS should be sent direct to the same address, by the same date.

Acknowledgement may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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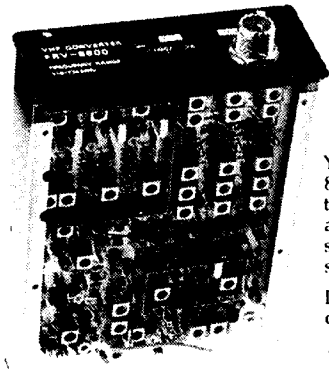

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Editor's Comment

WHY ISN'T JOE IN THE INSTITUTE?

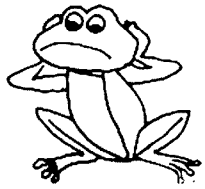
We have all encountered Joe (or Fred or Jim or Bill or Sue) many times in our amateur careers. They have become particularly obvious during the period of the WIA 75 Award, from last March until the end of our 75th Anniversary Year on 31st December 1985. Now they will recede once again into comfortable anonymity. Of course, they are the active amateurs who do not belong to the WIA, so had to admit, with some embarrassment, when asked for their 75 Award membership number that they didn't have one. Mostly, they then felt obliged to give a reason why. Usually it was some variation on *"haven't got around to it"*, or *"off the air while moving house, so didn't bother to renew"*, or (more rarely) *"can't agree with what they are doing about such-and-such"*. Some even said *"it costs too much"*.

I would like to address a few New Year words to Joe (or Fred or Jim or Bill or Sue). Perhaps you, the WIA member whose AR this is, might show it to your nearby Joe (or whoever). Obviously this magazine is a start. Even if you were to receive only 12 issues of AR and nothing else for your annual subscription, it is still cheaper than almost any other amateur radio magazine. But there is much more! Throughout Australia you have the services of the WIA QSL Bureau. You can buy a wide range of technical books at competitive prices from the Magpubs service, via your State Division. You can buy components for home-brew projects from the service run by some Divisions. But more than anything else, you have the benefit of the status and conditions applying to the Amateur Service in Australia, almost entirely achieved to your advantage by WIA funds and effort, and WIA negotiation with the Department of Communications. *Can you really feel happy about using WIA-funded repeaters on VHF and UHF if you haven't contributed to their installation and maintenance? How about, as a non-member, participating in WIA contests?*

WIA negotiation with DOC has produced such benefits as the full recognition of the Amateur Service and its requirements, as spelled out in the new Radiocommunications Act. The right to handle third-party traffic and to use phone-patch when needed have come about entirely because of WIA representation. Our status with DOC, the Government, and the world is such that our 75th Anniversary Dinner was attended by the Secretary General of the ITU, the Minister for Communications, and leading amateurs from 14 countries. Goodwill messages were received from the Prime Minister of Australia and the President of the United States of America.

You can be proud to belong to the world's oldest amateur radio society. Perhaps you still don't like some of our policies. Join us and work to change them. You can have no effect by remaining aloof, but all members' opinions are respected in our most democratic of organisations. You, Joe, are even free to remain a non-member and still benefit from WIA activities. *But is that really what you want? Yes, Joe, why aren't you in the Institute? Why not resolve for 1986 "I am going to join the WIA"?*

Bill Rice VK3ABP
Editor
AR



Main QSP

BAND PLANNING

At the 1985 Federal Convention, the matter of Band Planning came in for considerable discussion. The Federal Council realised that well-considered Band Plans could not be developed over a few days by seven councillors, who might not even be experts in the field. Consequently, the Council opted to develop Band Plans on a continuing basis with the Federal Technical Advisory Committee preparing draft proposals for publication in Amateur Radio. Comments would be sought from members and refined Band Plans produced for ratification by Federal Councillors at the next WIA Convention.

This paper, prepared by a member of the Executive, aims to review the background to Band Planning, and set the scene for specific band oriented consideration papers, which will be published throughout the year.

HISTORICAL

In the beginning of "wireless", there was no Band Planning and indeed, little, or no legislation. It was only when the commercial applications of wireless communications became apparent, and escalating uncontrolled use of the spectrum led to interference and chaos, that controls were introduced. Many amateurs do not realise how near their hobby was to becoming totally prohibited due to interference to emergency traffic, around 1912[1].

The early international Band Planning took the form of "place the amateurs above 200 metres, they will not be a problem there"[2]. As time progressed, spectrum allocation became more involved and a series of World Administrative Radio Conferences (WARC) took place. The WARCs of 1927, 1947, and 1979 probably had the greatest impact upon the amateur community; the first because it was the first international conference held, the second because of its immediate post war nature, and the ability of amateurs to use technologies and surplus equipment arising from war efforts. The third was important because of the combination of technological advances, and the need for the amateur community to speak up to retain their existing allocations under pressure from developing nations for HF allocations.

Within this frame-work, spectrum management is carried out in detail at the national level. Some nations have chosen to tightly regulate their amateur allocations, as to authorised modes, band-widths, powers and licence grades (eg USA). Others have made broad allocations, and set general regulations for orderly operating. For example, listen before transmitting, avoid interfering, and respond to emergency calls; as has happened in Australia. This latter set of circumstances accords with our stated policy of seeking de-regulation, but it brings with it an implied responsible attitude from the amateur community, which must agree and abide by its own self-generated band usage plans. Furthermore, this must encompass both the members of the national society (the WIA), and non-member amateurs.

WORLD ADMINISTRATIVE RADIO CONFERENCES

The WARCs that have influenced amateur radio in some significant manner, and some outlines of their effect are now described.

Washington 1927 International Conference

This first international conference followed after several US National Radio Conferences (1922, 1923, and 1924). The US amateurs, by this stage, had a number of harmonically related bands on 80, 40, 20 and five metres wave-length. The Conference agreed to ban spark transmissions after 1930, and allocated the spectrum from 10kHz to 60MHz. US amateurs, who had 12MHz total of spectrum prior to the Conference, ended up with 7.5MHz in all, but were covered now by international treaty and the harmonic relationship was confirmed.

Madrid 1932 & Cairo 1938

At the Madrid International Conference in 1932, "telecommunications" was defined, the International Telecommunications Union (ITU) formed from the earlier International Telegraphy Union, and regulations drafted; these were called the Convention.

At Cairo, in 1938, radio frequencies were assigned to international aviation routes[3].

WARC 1947 Atlantic City

At the Atlantic City Radio Conference, in 1947, new amateur allocations were made at 21, 144, and 420MHz. Also, other UHF/Microwave frequencies. Changes were also made to the 3.5, 7, and 14MHz amateur segments.

This was the first evidence of the appearance of amateur allocations, differing from ITU Region to Region, depending upon the political clout of the Region, and their collective attitude to amateur radio[4].

Geneva Radio Conference 1959

Pressure on the 7MHz band allocation continued at Geneva in 1959, coupled with pressure to re-allocate the top of the 28MHz band. In the event, 7MHz suffered and amateur allocations differed between Regions, whilst the 28MHz bids collapsed late in the Conference.

The contributions to the recent International Geophysical Year (IGY) by

amateurs helped their creditability, due to the period of visibility leading up to the Conference.

The need for a strong IARU presence was demonstrated, for although over 90 nations were represented at Geneva, less than 60 had established amateur radio societies.

Of particular interest to Australian amateurs was the drastic anti-amateur proposals developed by the national authority, and kept secret from the amateurs until just before the Conference. The late John Moyle VK2JU, representing the WIA, was attached to the Australian delegation and his presence contributed to the outcome, as far as amateurs were concerned, demonstrating the value of amateur representation on the national delegation[5].

WARC 1979

Nearly every amateur band was varied in some way by WARC79. Three new HF bands were allotted, and the amateur satellite service was formally established.

Changes were necessarily slow in the implementation and are being influenced by falling sunspot activity. The national Band Plans have been issued and now the amateur community is actively involved in determining its own Band Plans, taking due cognisance of neighbouring amateur users. In particular, the use of telephony on the 10MHz band is a matter of difference between the Australian amateur and his/her colleagues in most overseas countries.

Of interest for Australian amateurs was the inclusion of two of their number in the official delegation. David Wardlaw VK3ADW, and Michael Owen VK3KI contributed significantly to the Australian presence at Geneva.

GENTLEMAN'S AGREEMENTS

Many years ago, Australian amateurs realised the advantages, conferred upon them by broad government regulations, had to be supplemented by self-disciplinary constraints as to band mode usage. This led to "Gentleman's Agreements", so named because all amateurs were believed to be gentlemen who would voluntarily abide by these un-enforcable agreements on band occupancy.

In those days, CW and AM were the predominant modes, most transmissions were crystal locked to frequency and control of occupied bandwidth was not as effective as it is today. Gentleman's Agreements were derived, to a large extent, from international band planning, for DX had (and still has) a considerable influence on operating practices.

The agreements were able to absorb the change, from AM to SSB, with little worry as a reduction in occupied bandwidth per user, and consequent increased number of users able to communicate without interference resulted. However, the introduction of narrow band modes occupying a greater band width than CW, yet less than SSB and the requirement for beacons and like services overtaxed the existing system.

A similar pressure was placed on VHF Gentleman's Agreements, by the high demand for frequency pairs, for FM repeaters. In hindsight, receiver filter technology barely kept pace with the narrowing of FM channel allocations.

Ultimately, this pressure led to the near collapse of "bare bones" gentleman's agreements as first formulated and caused their replacement with more complex, but still voluntarily adopted Band Plans.

BAND PLANNING PHILOSOPHIES

The matter of Band Planning is one open to much emotional expression, it is a subject on which nearly every amateur is an "instant expert' and consideration of hard facts is always the last recourse.

Band Plans, if they are to be successful, must satisfy six principles. These are:

- *Accord with international band usage*
- *All users must be considered*
- *Spectrum must be allocated according to mode requirements and usage*
- *The Band Plan must be dynamic, yet evolutionary*
- *The Band Plan must include forward thinking*
- *Effective promulgation of the plan to members of the national society and non-members, alike*

Accord with International Band Usage — It is sensible that Australian Band Plans, for those frequency bands on which international communications are possible (and these include VHF/UHF satellite applications) accord, as far as is possible, with other nations plans.

Consider all Users — If the expectation that all users will abide by a Band Plan is to be achieved, those users must feel that their individual needs have been accommodated in some tangible way. This could range from dedicated spectrum space for popular modes to co-locating less used modes, which do not mutually interfere. Often allocation of a general, or all modes segment will suffice.

Spectrum Allocated According to Requirements — Not only must all band users interests be considered, they must also be reflected in the plan according to their preceived importance.

Often this is influenced by the popularity of the various modes, but it is also conditioned by the modes band-width demands. The allocation is always a compromise for a wide band mode like ATV, in being allocated say one channel, demands a greater band- width per active operator than say SSB to RTTY.

As well as the mode band-width requirement there are also adjacent channel compatibility considerations. Here the weak signal (EME) segment is the most demanding and is often placed on a band edge to provide some isolation. However, care should be taken to examine the national Band Plan for the spectrum user. Adjacent to the amateur band may not be a suitable neighbour for some amateur modes.

Dynamic Band Plans — It is obvious that amateur Band Planning must move with the times and remain up-to-date, yet changes must not be frequent or drastic in nature or they will be ignored and chaos will reign *(again! !).* Of recent times, the use of "layered" Band Plans, built upon a basic framework of telegraphy and telephony sub-bands, has expanded Band Planning In an evolutionary way. Layered Band Plans have a deal of transparency (to use computer 'jargon') and appear to satisfy a wide range of users and modes.

Forward Thinking — Band Plans can be forward thinking, provided they are not developed in too fine a detail. Often allocation of band space for a range of modes (having differing band-widths) will suffice. It matters not, what detailed intelligence is being carried, provided the modulation mode employed is in its assigned band segment. As an example, digital "slow scan" television can be transmitted over a range of Baud rates and it is the Baud rate which dictates the required band- width, and hence the modulation mode selected.

Promulgation of Band Plans — A Band Plan is ultimately as good as the notice people take of it, and their eventual compliance with it. If Band Plans change too frequently, or too drastically, adherence will be low through no fault of the average user. Indeed, it has been cynically said the re-learning time span of an obstinate amateur is one life span (his/hers!).

The Band Plan has to be brought to the attention of as many operators as possible, members of the national society and non- members. The latter can adopt an attitude of *"why should I co-operate? I did not agree to this plan"* and at times members in the former group adopt a like attitude. In these circumstances, the layered plan has the greatest possibility of success, as evidence by a measure of adherence to the plan.

In summary, Band Plans should be simple to apply and change infrequently to achieve acceptability by a majority of operators, yet provide adequate guidance for the way-out specialist wondering where to radiate his signal with the minimum of interference.

Specific Band Plans — It is not intended to go into the details of Band Plan allocations in this paper, but rather to highlight certain areas which need consideration in the near future.

Following dissatisfaction with discrete segment Band Plans, particularly with the introduction of exclusive narrow band mode segments, the 1985 WIA Convention adopted the layered Band Planning approach.

Furthermore, it recognised that Band Planning could not be carried out effectively over a few days at a convention. Consequently, the Council directed the Federal Technical Advisory Committee (FTAC) to develop draft Band Plans for circulation and comment throughout the year, leading to ratification at annual conventions.

HF Plans — Here the matters of interest include restructuring the generally acceptable existing plans into layered plans, obtaining agreement on narrow band mode segments, beacon allocations, and the continued use of telephony on 10MHz.

VHF/UHF Plans — Because of the high interest in FM speech communications over the last 15 to 20 years, these bands have been subjected to considerable planning with regrettably some degree of upheaval. The burning issue for Band Planning relates to the balance of band space allocated to FM repeaters, both voice and data, compared with other applications, including data communications and message storage devices (electronic mail boxes).

As the amateur service is the secondary service on UHF, the Band Plans adopted must avoid harmful interference to the primary service.

Microwave Plans — Amateur microwave frequency allocations are generally fairly similar across the three IARU Regions as an outcome of WARC79. What should therefore be an easy Band Planning task, adopting overseas plans is, unfortunately, complicated by the secondary service status of the amateur. Band Plans must be adapted to suit both national and local conditions, and frequently there are pressures, and sometimes inducements from the amateur equipment supply industry to adopt overseas standards because of the supposedly uneconomically small production runs for products especially engineered for the Australian market.

These problems have become evident in the selection of a frequency offset for repeater use on 1296MHz, whilst avoiding interference to D of A radars.

User Involvement In Band Planning — Although the development of particular Band Plans is a FTAC responsibility, they cannot do it effectively in isolation. Consequently, should you have views on any Band Planning matters, send them to your Divisional technical advisory committee or FTAC. User involvement leads to user awareness, one of the six principles upon which Band Planning is based.

REFERENCES

1 Two Hundred Metres and Down (The Story of Amateur Radio). Clinton DeSoto
2 From Spark to Satellite. Stanley Leinwoll. Chapter 12
3 Ibid, Chapter 14
4 World at their Fingertips. John Clarricoats. Chapter 26
5 Ibid. Chapter 31

AR

WIA News

PHONE PATCH UPDATE

Considerable progress has been made on phone patch for radio amateurs following two meetings in 1985, between the WIA and Telecom Australia.

It was through face-to-face discussion that both parties achieved a greater understanding of the issues surrounding phone patch. Radio amateurs have been puzzled why Telecom has restricted access to the Interconnection of their radios to the telephone network.

It would also have been true in the past to say Telecom had not fully understood, and appreciated the nature of the Amateur Radio Service. The WIA, following discussions with Telecom, understands that amateur phone patch cannot be considered in Isolation.

The interconnection of radio to the national telephone network is a complex matter which, obviously, has possible wide commercial application. Telecom draws a distinction between radio (voice) interconnect, and the interconnection of hobby computers to the telephone network.

Computer hobbyists are allowed to use type approved modems to Interconnect their computers direct into an ordinary phone socket. But this type of interconnect cannot be used as an argument to get unrestricted phone patch for radio amateurs.

The main reason Telecom has restricted radio/telephone Interconnect is to stop long distance radio links being set up in competition to the trunk telephone system. Telecom has a national carrier role, and is required to provide a uniform source at a uniform price throughout Australia. This relies on cross-subsidies from the revenue making parts of the telephone network — it believes radio interconnect could 'cream-off' revenue.

Also, part of its national carrier role is the mobile telephone service — it doesn't want direct commercial competitors in this market area. However, it does permit, with restrictions, individual businesses, and common-user groups, to interconnect radio and the phone network. There is a scale of fees charged, restrictions on coverage area, and a ban on handling traffic for third parties.

At meetings between the WIA's Federal Executive member, Jack O'Shannassy VK3SP, WIA Victorian President, Jim Linton VK3PC, and Telecom Representatives during August and October, both the Institute's and Telecom's positions were canvassed. The WIA opposed the restriction on double-ended phone patch within Australia — that is phone-radio-radio-phone interconnection. Telecom stated that this restriction applied, not only to radio amateurs, but all radio interconnects, because of its potential to bypass the Public Switched Telephone Network, and cost Telecom revenue.

The WIA does not accept that the use of double-ended phone patch by the Amateur Radio Service would have an impact on Telecom revenue, and it will continue to seek double-ended phone patch for all radio amateurs. However, as a result of cordial negotiations with Telecom, double-ended phone patch is now available for emergency use and training (see below).

The $2 per month access charge levied on radio amateurs with phone patch through their telephone account is considered by Telecom to be the lowest possible charge it could set.

What emerged out of the Telecom/WIA talks were, special conditions for the Amateur Radio Service, which follow, with WIA clarification in brackets:

The normal mode of phone patch operation is only at a home station at one end of a radio-communication service.

In a normal single ended phone patch connection, normal third party requirements will apply to conversation content.

Phone patch access for mobile units will be permitted via a home station, but not via a repeater. Phone patch connections to repeaters will not be permitted. (Repeater contacts can be phone patched, but only via a home station).

Under WICEN operation, or other emergencies involving natural disaster and/or life threatening situations, together with unavailability of normal communications, double ended phone patch will be permitted as a special exception.

Under duly authorised WICEN Exercises, training involving the use of double ended phone patch will be permitted on a self regulation basis by the Wireless Institute of Australia. The WIA will be responsible for authorising such exercises and will keep a record of such exercises and training arrangements. These records will include the details of the radio amateurs involved, the call signs, and period of authorisation. (For WICEN training, phone patch in all its forms can be used. Telecom recognises the need to train with equipment that will be used in emergencies). This authorisation procedure will be available to any radio amateur wishing to establish local community emergency arrangements to the Institute's standards of service. (This can include appropriate community service activities and public displays of the hobby).

If the WIA develops suitable circuitry and construction details for an interconnect unit, Telecom issue, subject to satisfactory testing, an appropriate "Authority to Supply for Connection to the Network". (This opens the way for homebrew phone patch which will meet Telecom standards).

Telecom will authorise a radio amateur to interconnect using this device, subject to certification by the application that the equipment has been constructed in accordance with the specifications approved by Telecom.

The above arrangements and conditions will be reviewed 18 months after publication of the interface equipment details in the Wireless Institute Journal.

The WIA plans further negotiations with Telecom, and will keep members advised.

Compiled by Jim Linton VK3PC, with the co-operation of Jack O'Shannassy VK3SP & Telecom Australia

AR

WIA Seventy Fifth Anniversary

ADDRESS TO THE WIA 75TH ANNIVERSARY DINNER BY MR R E BUTLER

Mr Chairman,
Your Excellency,
Distinguished Visitors,
Ladies and Gentlemen,

I am deeply honoured for the invitation to speak at the 75th commemorative Dinner of the Wireless Institute of Australia, the oldest Institute of its kind in the world, and to bring the greetings of the ITU as well as many amateur radio enthusiasts in contact with 4U1ITU.

Amateur radio is the only hobby provided for by the International Treaty, ie: the Radio Regulations annexed to the International Telecommunication Convention. The Radio Regulations define amateur radio as "a service of self-training, intercommunication and technical investigations carried on by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest".

Furthermore, in 1971 the World Administrative Radio Conference for Space Telecommunications provided for the Amateur Satellite Service.

Those of you who are familiar with international legislative processes would realise that these unique world-wide recognitions as well as accompanying obligations did not emerge over a few months, years or even decades. They emerged from the character, and I may add, the reliable and solid contribution of the renowned radio enthusiasts pursuing their curiosity into the radio frequency phenomenon investigation and practical operation experience, as well as a wealth of dialogue and community experience with others locally, regionally and indeed globally. These characteristics have always been manifested in the energies of your Institute; indeed the history of telecommunications In Australia is studded with the contributions of the Institute's founding fathers and its members to radio branch of telecommunications. Even before the formal establishment of the Institute, the example and brilliance of Sir Charles Todd and his team for the completion of the overland telegraph, began to orientate attention to wireless transmission. Professor William Bragg gave the first public demonstration of wireless telegraph apparatus at the University of Adelaide in September 1897, and then, in 1899, after correspondence with Marconi and financial assistance from Postmaster-General Sir Charles Todd (as always the 'Post Office' was a big help in advancing new communication ideas), wireless telegraphy messages were successfully transmitted from West Terrace to Henley Beach in South Australia.

Let us reflect, too, on the significance of H W Jenvey's contact with

the Duke of York's escort in external waters during the Royal visit in 1901. It was an early beginning of what we now describe as the Maritime Mobile Service.

The names of Bartholomew, Maclurcan, Read, Allsop, Coxon, Davis, Traeger, Reverend Flynn, and Sydney Witt (later to become a Member of the International Frequency Registration Board) also come easily to mind — a nucleus only of names, who without Fisk and Hooke and a legion of talented engineers and administrators, radio would not have developed so quickly and contributed so much to the development of the Australian Nation. The Flying Doctor's Service, School of the Air, Civil Aviation and the Public Telegraph Service and many towns and outback centres services, owe much to the co-operation stimulated or provided by those personalities and the Institute.

Reverting to the international elements, the young Institute and its band of radio activities, along with their colleagues in other countries concentrated on the study of shortwave propagation. They discovered the properties of the ionosphere, making the first inroads into space and prepared the way for the systematic division of the radio frequency spectrum, as we know it today.

Radio amateurs were thus involved in the exploration of space long before its material use with space stations and satellites.

Always evident by an active presence in world administration radio conferences, they have earned their formal recognition in the ITU statutes. Conscious also of the importance of sharing their knowledge with others, the IARU, of which your Institute is an active member in Region 3, is now co-operating with the ITU with a view to organising training courses concerning the administration of amateur radio in Africa and Asia and the Pacific.

Allow me to salute the predecessors who set the promotion of the radio techniques in action and I wish the Institute long service and prosperity.

R E Butler
Secretary-General
International Telecommunication Union
9th November 1985

NATIONAL FOX HUNT CHAMPIONSHIP

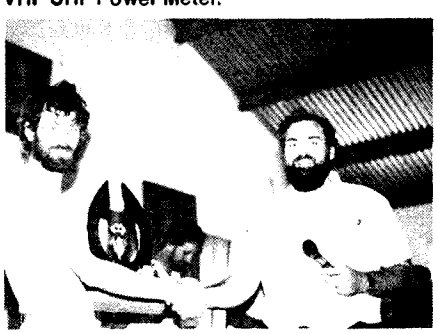
The inaugural National Fox Hunt Championships were held in conjunction with the Wagga Wagga Convention on the weekend of 26-27th October 1985, as part of the 75th Anniversary Celebrations of the WIA.

Teams representing the Australian Capital Territory, New South Wales, and Victoria took part and hunts were held on 3.5, 28, 144, and 432MHz over the two days and night hunts on 144MHz were held on the Saturday night. The lead in the Championships varied between the two Victorian teams of VK3BMV and VK3BLI, with the eventual winner being Ewen VK3BMV. Ewen's team included Geoff VK3CGH and Ian VK3BRY, and they were the recipients of the trophies and the Icom IC-2A, which had been kindly donated for the occasion by Icom Australia Pty Ltd.

The Winning Team — Ian VK3BRY, Geoff VK3CGH and Ewen VK3BMV.

Greg VK3BGW watches as Ed Webb, of Webb Electronics, presents the Icom IC-2A to Ewen VK3BMV.

Second Place was won by John VK3YEA, Jannet, and Henk VK3BLI. They were presented with the GFS Electronic prize — a VHF UHF Power Meter.



FROM LEFT: Ewen VK3BMV, Champion Fox Hunter, and Greg VK3BGW.

Henk VK3BLI, and his team of John VK3YEA and Jannet took out the second prize, which was a VHF/UHF power meter kindly donated by GFS Electronic Imports.

Ewen was the winner of the Victorian Championships and was sponsored for travel and accommodation by the Victorian Division, so all the practice certainly paid off!

Special thanks to Icom Australia Pty Ltd, GFS Electronic Imports, Kyoshi Fukushima and Greg Whiter for their generous donations and support of this auspicious occasion. Also, thanks to the Victorian Division of the WIA and Paul VK3DIP for the loan of fox transmitters. The following from the Wagga Wagga Club also deserve special thanks for their assistance

in conducting this event. Peter VK2KZZ, Geoff VK2KCL, and Peter VK2APW.

It is expected that this will become an annual event and discussions are now taking place for another location to host the event this year. This will be published as soon as possible to allow as many entrants as possible to attend.

The first prize was presented by Edd Webb, proprietor of Webb Electronics, the Albury agent for Icom equipment.

MORSE CODE PRACTICE GENERATOR

Lindsay Stronell VK3BRV
214 Jasper Road, Bentleigh, Vic. 3204

This generator is, in fact, a computer programme developed on and for an IBM-PC compatible personal computer. The object of the exercise was to produce a simple programme to generate Morse code for practice receiving skills.

However, every time it was run, I thought of a new wrinkle to add to it, hence it seemingly 'grew like Topsy'. One more addition that may be added, but as yet I have not got around to doing, is to use one of the output ports to pass the code on to the outside world, both as a tone and a TTL level signal. Maybe someone else may be able to do this.

When the programme is run, the first page on the screen asks if you are using a colour or monochrome display.

The second page asks if you want to have 10 WPM at 800Hz tone or, if you want to set the parameters yourself. You can then change the speed to anything between five and 50 WPM and the tone between 200 and 5000Hz. Also, you can send the characters at your chosen speed, whilst the spaces between them can be set to any lower speed, both between five and 50 WPM.

I have found that the Morse is much easier to learn if the characters are sent at the speed required for the test, 10 to 12 WPM, and to start with the spacing set quite slow. This enables you to hear the sound of the character as a whole and not to try to count the individual elements as dots and dashes. As you progress, just increase the spacing speed.

Just to make things a little harder and to stop the learner journalising, the code is generated as groups of random letters with a smattering of numbers. For anyone to copy this 100 percent at the exam speed, passing the exam will be 'a piece of cake'.

Good luck . . . . .

AR

```
10 '       THIS PROGRAM WAS WRITTEN BY L.STRONELL VK3BRV 15-4-85
20 '
30 '       For use on an "IBM-PC" compatible computer, using "MICROSOFT"
40 '       BASICA language.
50 '
60 '
70 '
80 CLS:SCREEN 0:WIDTH 40:COLOR 7,0:KEY OFF                    'set up 1st page
90 LOCATE 1,14:PRINT "MORSE CODE GENERATOR"
100 LOCATE 7,12:PRINT "by LINZ, VK3BRV"
110 LOCATE 14,4 :PRINT "Are you using a colour display ?"
120 D$=INKEY$:IF D$="" THEN 120
130 IF D$="y" OR D$="Y" THEN 160 ELSE 140:                    'yes or no ?
140 R=15:G=15:B=7:Y=15:W=7:RF=31:                             'monochrome display
150 GOTO 190
160 R=4:G=10:B=5:Y=14:W=7:RF=20                               'colour display
170 '
180 '
190 LOCATE ...,0,7                                            'makes large cursor
200 CLS:                                                      'sets up 2nd page
210 COLOR R:
220 PRINT "          ************************"               'free plug for me
230 PRINT "          *                      *"
240 PRINT "          *";
250 COLOR G:PRINT " MORSE CODE GENERATOR ";
260 COLOR R:PRINT "*"
270 PRINT "          *                      *"
280 PRINT "          *";
290 COLOR G:PRINT "    by LINZ VK3BRV    ";
300 COLOR R:PRINT "*"
310 PRINT "          *                      *"
320 PRINT "          ************************"
330 COLOR R
340 DIM A$(36)
350 LOCATE 12,5:PRINT "Press 'RETURN' for 10 wpm"
360 LOCATE 15,5:PRINT "Press 'ESC' to set parameters"
370 E$=INKEY$:IF E$="" THEN 370
380 IF ASC(E$)=27 OR ASC(E$)=13 THEN 390 ELSE 370
390 LOCATE 12,5:PRINT SPC(35);                                'clear instructions
400 LOCATE 15,5:PRINT SPC(35);                                'ditto
410 IF ASC(E$)=27 THEN 1330:                                  'ESC key
420 IF ASC(E$)=13 THEN 440:                                   'RETURN key
430 GOTO 370:                                                 'neither key,try again
440 CH=1.65:SP=1.65:FREQ=800:                                 'set up 10wpm & 800hz
450 LOCATE 9,15:PRINT "Speed = 10 wpm";                       'display rate
460 PRINT
470 COLOR W
480                                                           'get rnd seed from clock
490 RANDOMIZE((VAL(MID$(TIME$,7,1)))+(VAL(MID$(TIME$,8,1))))
500 '
510                                                           'set up data array
520 A$(1)="01 A";
530 A$(2)="1000 B";                                           'a '1' represents a dash
540 A$(3)="1010 C"
550 A$(4)="100 D";                                            'a '0'represents a dot
560 A$(5)="0 E"
570 A$(6)="0010 F"
580 A$(7)="110 G
590 A$(8)="0000 H
600 A$(9)="00 I
610 A$(10)="0111 J
620 A$(11)="101 K
630 A$(12)="0100 L
640 A$(13)="11 M
650 A$(14)="10 N
660 A$(15)="111 O
670 A$(16)="0110 P
680 A$(17)="1101 Q
690 A$(18)="010 R
700 A$(19)="000 S
710 A$(20)="1 T
720 A$(21)="001 U
730 A$(22)="0001 V
740 A$(23)="011 W
750 A$(24)="1001 X
760 A$(25)="1011 Y
770 A$(26)="1100 Z
780 '
790 A$(27)="01111 1
800 A$(28)="00111 2
810 A$(29)="00011 3
820 A$(30)="00001 4
830 A$(31)="00000 5
840 A$(32)="10000 6
850 A$(33)="11000 7
860 A$(34)="11100 8
870 A$(35)="11110 9
880 A$(36)="11111 0
890 '
900 '
910 FOR GROUP = 1 TO 50:                                     '# of 5 chr groups
920 FOR I = 1 TO 5:                                           '# of chrs in group
930 NUMBER=INT(RND*36)+1:                                     'generate random #
940 IF NUMBER>26 AND Z>0 THEN Z=1:GOTO 930:                   'if a #, try again
950 CHAR$ = A$(NUMBER):                                       'get a chr
960 Z=1
970 FOR N = 1 TO LEN(CHAR$)-2:                                'search for dots & dashes
980 D$=MID$(CHAR$,N,1)
990                                                           'if a dot, make it
1000 IF D$="0" THEN SOUND FREQ,CH:SOUND 32767,CH:GOTO 1040
1010                                                          'must've been a dash
1020                                                          'so make one
1030 SOUND FREQ,3*CH:SOUND 32767,CH
1040 NEXT N
1050 E$=INKEY$:IF E$="" THEN 1070 ELSE 1060:                  'if no key hit carry on
1060 IF ASC(E$)=27 THEN WIDTH 80:END:                         'exit program if ESC hit
1070 PRINT RIGHT$(CHAR$,1);:                                  'display chr just sounded
1080 SOUND 32767,3*SP
1090 NEXT I:                                                  'go fetch another 'un
1100 PRINT " ";
1110 SOUND 32767,5*SP:                                        'silence between groups
1120 NEXT GROUP:                                              'go make another group
1130 PRINT :PRINT
1140 COLOR RF
1150 PRINT "HIT SPACE BAR FOR MORE ";                         'Gee whiz, I'm learning
1160 PRINT
1170 COLOR W
1180 E$=INKEY$:IF E$="" THEN 1180:                            'wait for space bar
1190 IF E$=" " THEN 1720:ELSE WIDTH 80:END:                   'wipe off last lot or end
1200
1210 '
1220 '
1230 '
1240 LOCATE LIN,31:PRINT SPC(10);             'wipe out silly entry
1250 LOCATE LIN,29:COLOR Y:PRINT " Try again ";   'display message
1260 SOUND 500,.5:SOUND 600,.5:SOUND 300,.5:COLOR B:   'error noise
1270 FOR T=1 TO 5##:NEXT T:                           'message view time
1280 LOCATE LIN,29:PRINT SPC(12):                     'remove message
1290 RETURN
1300 '
1310 '
1320 '
1330 LOCATE 13,5:PRINT "Code speed     5-50  wpm":  'display parameters
1340 LOCATE 14,5:PRINT "Tone freq.   200-5000 Hz"
1350 LOCATE 15,5:PRINT "Char. speed    5-50  wpm"
1360 LOCATE 16,5:PRINT "Space speed    5-50  wpm"
1370 '
1380 '
1390 LOCATE 13,31:INPUT WPM$                          'load new code speed
1400 IF WPM$="" THEN LOCATE 13,5:PRINT SPC(33):GOTO 1450:'no entry? wipe it
1410 LIN=13
1420 WPM=VAL(WPM$)
1430 IF WPM<5 OR WPM>50 THEN GOSUB 1240:GOTO 1390
1440 '
1450 LOCATE 14,31:INPUT FREQ$                         'load new tone frequency
1460 IF FREQ$="" THEN LOCATE 14,31:PRINT "800":FREQ=800:GOTO 1520:'default
1470 LIN=14
1480 FREQ=VAL(FREQ$)
1490 IF FREQ<200 OR FREQ>5000 THEN GOSUB 1240:GOTO 1450:'   wrong? re-enter
1500 '
```

Continued page 8

```
1510 '
1520 IF WPM > 0 THEN CH=16.5/WPM:SP=16.5/WPM:GOTO 1720: 'set up speed & wipe
1530 '
1540 LOCATE 15,1:INPUT CHAR$;                          'load character speed
1550 IF CHAR$="" THEN LOCATE 15,22:PRINT "14";:CHAR=10:GOTO 1620:'     default 10
1560 LIN=15
1570 CHAR=VAL(CHAR$)
1580 IF CHAR<5 OR CHAR>50 THEN GOSUB 1740 ELSE 1600:     'oops, wrong numbers
1590 GOTO 1540;                                        'try again
1600 '
1610 '
1620 LOCATE 16,1:INPUT SPACE$)                         'load spaces speed
1630 IF SPACE$="" THEN LOCATE 16,22:PRINT "5";:SPACE=5:GOTO 1700:'     default 5
1640 LIN=16
1650 SPACE=VAL(SPACE$)
1660 IF SPACE<5 OR SPACE>50 OR SPACE<CHAR THEN GOSUB 1740 ELSE 1680:'  oops
```

```
1670 GOTO 1620
1680 '
1690 '
1700 CH=16.5/CHAR:SP=16.5/SPACE
1710 '
1720 FOR J=9 TO 22:LOCATE J,1:                         'this lot wipes out the
1730 PRINT SPC(20);SPC(20):NEXT J                      'lower portion of screen
1740 '
1750                                                   'this lot lets you know
1760                                                   'what parameters you
1770                                                   'have selected.
1780 IF WPM > 0 THEN LOCATE 9,15:COLOR 5:PRINT "Speed =";WPM;"wpm"
1790 IF WPM=0 THEN LOCATE 9,2 ELSE 1820
1800 PRINT "Characters at";CHAR;"wpm spaced at";SPACE;"wpm"
1810 '
1820 LOCATE 11,1:                                      'get ready to write
1830 GOTO 460
```

WIA 75 INTERNATIONAL RTTY ART COMPETITION

Jim Linton VK3PC
WIA PRESIDENT VK3 DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

A total of 29 entries were received from Australia, North America, and Europe, making this international activity for the WIA's Anniversary Year a success.

Sadly, all VK entrants were from Victoria, despite widespread publicity no RTTY artist, or RTTY picture collector outside Victoria entered.

It is hoped this competition will spur on the art of making RTTY pictures in Australia.

Judging Co-Ordinator, Fred McConnell VK3BOU, has offered to conduct another competition,which is to be announced, by the WIA Victorian Division, during this year. Fred and his fellow judges agreed the entries received were of a high standard.

There were three categories:

a — Best hand-generated original submitted by its author, other than VK

b — Best hand-generated original submitted by VK

c — Open-Section . . . for non-original works, or computer-generated RTTY pictures

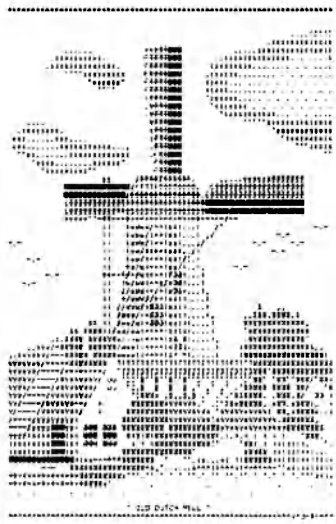
An independent judging panel comprised — Peter Ford VK3YTB; Arthur Fraser VK3BII; Fred McConnell VK3BOU; Barry Nolan SWL; and Roger Harrison VK2ZTB. Each judge was required to submit a separate judging sheet for each entry, and was asked to allocate marks out of a maximum possible 10 for the following aspects of the picture.

1 — Choice of subject
2 — Excellence of technique
3 — Degree of difficulty
4 — Formatting of the tape
5 — Suitability for publication

Judges points were then added up for each individual entry, with a maximum possible of 250 points.

All participants have been advised of the judging, and first in each category will receive a gold medallion. Category winners and placings follow.

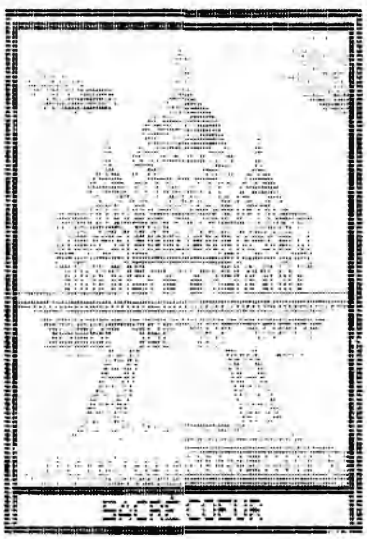
PLACING	NAME OF SUBJECT	NAME/CALL SIGN	SCORE
CATEGORY A			
1st	Macaw Parrots	**Alfred La Vorgna WA2OQJ**	203
2nd	Mr President	**Alfred La Vorgna WA2OQJ**	196
3rd	Felix the Cat	**Alfred La Vorgna WA2OQJ**	190
4th	Off the the Moon	**Jas Cull VE7ARJ**	182
5th	Sparkie	**Jas Cull VE7ARJ**	176
6th	Space Age	**Jas Cull VE7ARJ**	162
7th	My Home is my Castle	**Klaus Zielski DF7FB**	156
8th	Tiger	**Wolfgang Drewes DJ2OJ**	134
CATEGORY B			
1st	Old Dutch Mill	**L Rohrlach VK3KAF**	215
2nd	Sacre Coeur	**R Tippett VK3DRT**	214
2nd	Goofy	**R Tippett VK3DRT**	214
3rd	Puffing Billy	**R Tippett VK3DRT**	207
4th	1949 MG TC	**R Tippett VK3DRT**	193
5th	Sylvester	**J Brennan VK3BNE**	187
6th	Barramundi	**R Tippett VK3DRT**	186
6th	Donald Duck	**L Rohrlach VK3KAF**	186
7th	Thought for the Day	**R Tippett VK3DRT**	176
8th	Road Runner	**R Tippett VK3DRT**	171
8th	Daniel Boone	**R Tippett VK3DRT**	171
9th	2m Ringo Ranger	**R Tippett VK3DRT**	170
10th	Iron Lady	**R Tippett VK3DRT**	159
11th	Princess Diana	**R Tippett VK3DRT**	154
CATEGORY C			
1st	Skipper	**J Brennan VK3BNE**	225
2nd	Mona Lisa	**Rudic Ladislav YU7SF**	209
3rd	Fang, a Siamese Cat	**J Brennan VK3BNE**	208
4th	I'll Drink to that	**R Tippett VK3DRT**	184
5th	Cuddles	**R Tippett VK3DRT**	179
6th	Mona Lisa	**R Tippett VK3DRT**	178
6th	Miss Collins	**L Rohrlach VK3KAF**	178



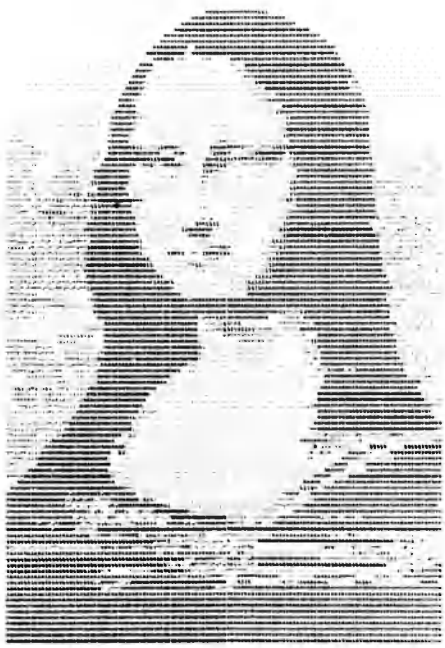
FAR LEFT: Skipper. CENTRE: Old Dutch Mill. TOP: Puffing Billy.

ABOVE: Felix the Cat. LEFT: Macaw Parrots.

ABOVE: Goofy. BELOW: Mona Lisa.



ABOVE: Mr President. LEFT: Sacre Coeur.



75 OHM HIGH PASS FILTER

Jim Preston VK6JP
14 Henley Road, Mount Pleasant, WA. 6153

One obvious cause of TVI is front end overload caused by strong signals, either fundamental or harmonic, which fall within the broad pass band of the TV receiver. This problem has been aggravated by the installation of VCRs, which are usually connected between the TV antenna and the TV receiver. Lack of, or inadequate shielding or filtering and, in some cases, diode switching in the VCR and TV receiver, compound the problem.

A recommended step in the elimination of this problem is the installation of a high pass filter at the input of the TV receiver or the VCR-TV combination. Those available commercially vary from the cheap and useless to the adequate but expensive. The filter described here can be built for about $10 if all the components have to be purchased, and much less if the junk box is helpful.

The design is substantially one described in QST of February 1982. The construction details in that article were not really concise and this article is an attempt to describe a filter which can be constructed using components readily available in Australia, and PCB artwork, which can be easily produced so that the performance of the filter can be duplicated without recourse to expensive test equipment.

CHOICE OF FILTER TYPE

High pass filter choice is restricted to a decision between Butterworth and Chebyshev designs. Their relative merits can be briefly summarised by stating that the Butterworth filter has a flat response in the pass band, while the Chebyshev has a steeper attenuation slope, but has a ripple in the pass band. This ripple can be designed to be about 1dB, so it is no disadvantage for this application.

Having decided on the type of filter, the number of elements can be selected. The seven element filter has a good attenuation slope (42dB/octave) without becoming too bulky. Traditional design methods for filters usually end up with non-standard capacitor values, but Wetherhold(1) used a computer to calculate designs based on standard capacitor values. This calculation provided parameters of all possible filter designs using standard capacitor values providing values of C and L, reflection coefficient, and cut-off frequency. Thus, small variations in cut-off frequency and reflection coefficient could be made to fit in with the standard capacitor values. In practical terms, if a cut-off frequency of 50MHz was desired and standard values of capacitor gave cut-off frequencies of 48 or 52MHz, the design would still be adequate. While a low reflection coefficient is desirable, a value of 20 percent produces a VSWR of 1.5. Most tabulated designs hold the reflection coefficient to six percent or less.

CIRCUIT DESCRIPTION AND CONSTRUCTION

The selected circuit configuration and component values are shown in Figure 1. The capacitors used are NPO and 10 percent tolerance. The inductors were wound on Amidon T37-0 toroids. This inductor type is self shielding, allowing the filter construction to be very compact. The required number of turns should be evenly spaced around the circumference of the toroid, leaving about 6mm between the ends of the winding. A little acrylic cement will hold the turns in place.

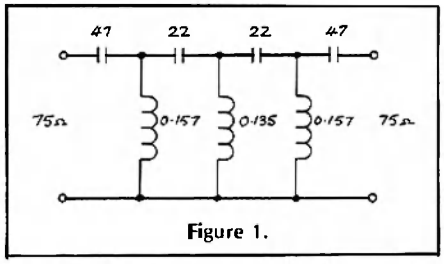


Figure 1.

Double sided fibre glass PC board was used as a base for mounting the components, the underside being used as a ground plane. The upper surface pattern is shown in Figure 2, and takes the form of a micro-strip line. Both sides of the top copper foil were connected to the lower ground plane by drilling three holes at each outer edge and soldering wire 'rivets'. Layout of the components is shown in Figure 3.

Coaxial cable with Belling Lee type coaxial fittings was used to connect the filter into the TV antenna lead. If a line socket is used on one end of the filter and a line plug is used on the other, no modifications to existing equipment or antenna leads is necessary. The coaxial cable should be good quality 75 ohm (RG59 or similar). Solder at least some strands of the copper sheath of this cable to the connector, or later corrosion may introduce a whole new set of problems. At the PC board the braid was connected to both edges of the strip line using a tinned copper wire saddle.

The PC board fits neatly into a plastic 35mm film container. Holes to suit the type of cable used (usually 5 or 6mm) are drilled in the bottom and lid of the container and these items fitted over the coaxial cable before soldering the cable, complete with connectors to the PC board. Convenient lengths of cable were 100mm for the container end and 80mm for the lid end. The filter is symmetrical so input and output are interchangeable.

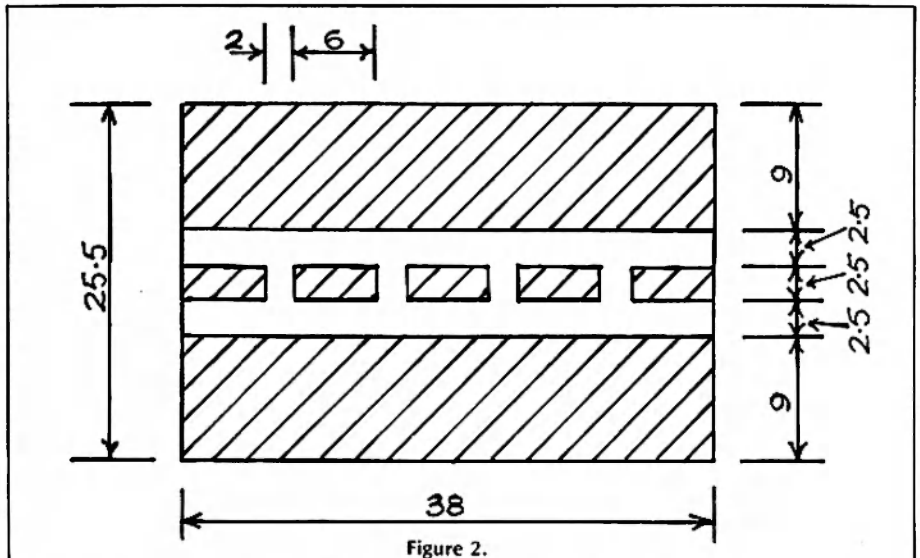


Figure 2.

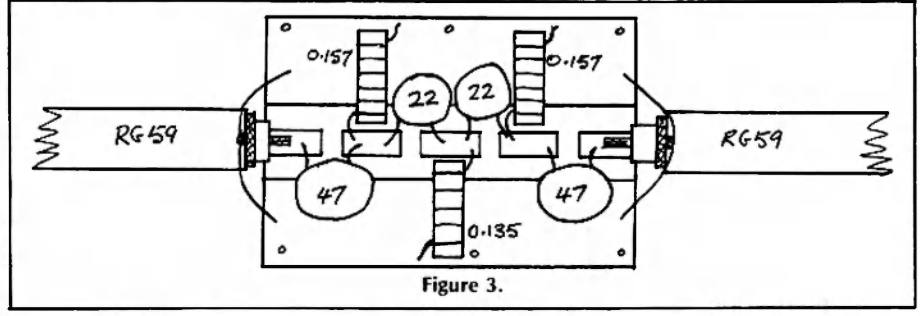
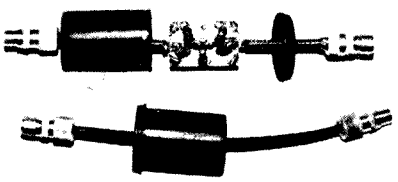


Figure 3.



The finished filter.

PC ARTWORK

No special artwork or photographic processes are required. Both sides of the board are covered with vinyl label obtained at any stationery shop. The ground plane requires no etching. The top side of the board simply has the strip line pattern drawn on the label stuck to its surface and the parts required to be etched, removed with a razor blade or scalpel. Take care to remove all traces of the adhesive from the label, or etching will be patchy. The PC boards are so small that one large label will enable three boards to be produced. Similar results can be obtained using a Dalo resist pen, but labels are cheaper than buying a pen especially for one board.

The board is etched using the usual methods and Ferric Chloride. After etching, the vinyl labels can be removed using thinners.

PERFORMANCE

The performance of a high pass filter can be judged by tabulating the frequencies at which three or four values of attenuation occur, and by checking the response in the pass-band. The response in the pass-band is particularly important when the filter is connected to a TV receiver, since any unwanted variations can degrade TV picture quality. The pass-band in this filter was within 1dB between 56MHz and 450MHz.

The efficiency of the filter as an attenuator of frequencies outside the pass-band can be determined by checking F-Ap, F3dB, F30dB and perhaps F50dB. The last three are the frequencies at which the subscripted levels of attentuation occur, ie 3dB, 30dB and 50dB. F-Ap is the frequency at which the pass-band attenuation level first exceeds the peak amplitude of the pass-band ripple which in the case of this filter happens to be 1dB. In practical terms, it is the corner frequency. Measurements of the parameters were difficult with the equipment available, requiring interpolation and a certain amount of estimation. The shape of the response did conform to that calculated, with F-Ap at 56MHz, F3dB at 51MHz and F30dB at 35MHz. It was not possible to determine F50dB, but the curve indicated increasing attenuation with decreasing frequency, so that the response at 14MHz could be expected to be about 70dB down.

CONCLUSION

This filter can be constructed without access to any special equipment or components. Four units have been built, and all show a similar response. Thanks are due to VK6NG, who assisted with the testing of the filters, and to VK6DV who tested one on his VCR, thereby cleaning-up his TVI problem.

NOTES: (1) E WETHERHOLD. '7-element 50-ohm Chebyshev Filters Using Standard-Value Capacitors', RF Design, February 1980, p26.

AR

Did you know?
FM Radio was first demonstrated on 5th January 1940.

SECOND OPERATOR — COMPUTER STYLE

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A computer used around the shack as a second operator will soon develop a personality, if it can talk. It is then able to give amusing/abusive error messages using the spoken word. And, when in a more serious mood, it is able to output spoken data to tape rather than digital data. This is sometimes better than hard copy, and cheaper than a printer.

My second operator is attached to a Dick Smith system 80 and resides at output Port FB (251). the interface circuitry is shown in the accompanying diagram.

CIRCUIT DESCRIPTION

Z3 and Z4A decode the address FB hex and Z1 combines the input/output request (IORQ) and either a write (WR) or a read (RD) to form enable signals for Z2 and Z5.

Z2 is an eight bit register and is used to latch information present on the data lines as its Pin 11 goes low.

The first six of these latched data lines are connected to the SPO256 Speech Processor Unit (SPU) and are latched into its input buffer when any input makes a low to high transition. The other two data lines from Z2 are connected to Z8, a 'D' type latch. The Q output of Z8 is set true or false by the code on these two data lines connected to its 'D' (data) and 'C' (clock) inputs; and are used to start and stop a cassette recorder via its 'remote input' socket.

Z5 is a hex buffer with tri-state outputs and is used to read the SBY (standby) and LRQ (load request) lines of the SPU onto the data bus when its Pin 1 goes low, whenever Port FB is read.

The codes output to the SPU determine the ALLPHONE (sound) to be uttered. By sequentially outputting codes, words are formed.

Z9, a 4N28 opto isolator, allows a voltage level translation between the interface unit and a cassette recorder remote socket, to enable the recorder to be started and stopped by our software. The audio output from Z7 may be connected to an 8ohm speaker or to an auxiliary input of the tape recorder, as required.

THE SPU

This is a SPO256-AL2, obtained from Radio Shack (Part Number 276-1784) and cost $25. It came supplied with a booklet which contains a list of the codes for the allphones, silent periods and a vocabulary. Also contained are some interesting and helpful tips on forming words. The crystal specified for the SPU is 3.12MHz, but I used a 3.5 meg chrominance crystal and it sounds okay.

PRINTED CIRCUIT BOARD

The patterns shown are for a double sided board. The audio circuit is built on a ground plane and the holes drilled from the bottom of the board will need to be relieved with a 3mm drill to get clearance between component leads and the ground plane. A wall is built around the audio circuit to form a shield. This is built with 25mm wide, PC board scraps, which were soldered to the ground plane.

READING AND WRITING TO THE SPU

The Allphone codes are to 63, only six lines are required to output these to the SPU via Z2.

Before outputting a code, we need to initialise by outputting a zero to port FB (OUT 251,0). This ensures that no matter what the next code out is, a low to high transition must occur on at least one of the data lines and the SPU will latch the code into its input buffer. Next, we output the code for the required allphone, say an 'R' (code 14 decimal); so we (OUT251,14) and the SPU SAYS 'R'. Prior to saying 'R', the SPU transfers the input code from its input buffer to internal logic for decoding and uttering. This action clears the input buffer and the status of the input buffer is flagged by the LRQ output of the SPU. LRQ is a logic 1 when the input buffer is full, and when it is at a logic 0 the input buffer may be reloaded. The SBY output of the SPU flags when the SPU is inactive by outputting a logic 1. The status of the LRQ and BSY outputs are connected to data lines D4 and D5, when Z5 is enabled with a read instruction — A=INP(251).

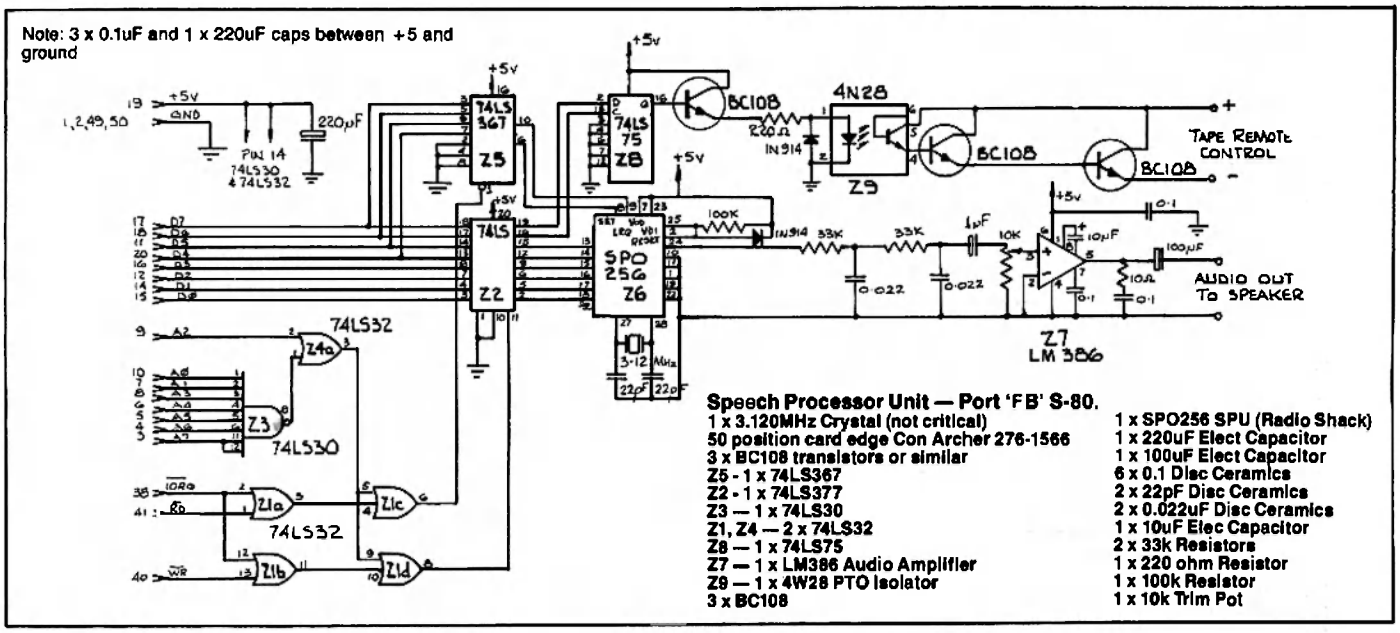
Let's have a look at what the instruction, A=INP(251), will return. Firstly, this will cause all data lines to be read, so let's have a look at the status of the data lines. The data lines D0 and D3 are floating and will return all ones (=15 DECIMAL); so the value of 'A' will return 15 plus the value of data lines D4 to D7. The following table sets out the status of the SPU and the value of 'A' after a A=INP(251) instruction.

LRQ STATUS	SBY STATUS	A=INP(251)=
0	1	16+15=31
0	0	0+15=15
1	0	32+15=47
1	1	48+15=63

Whenever the SPU is not able to receive an input code, the value of 'A' returned by an input instruction will be greater than 31.

Here is a subroutine to check the SPU status, and output code to it. The calling programme constructs G$ . . . . .

```
10 G$="27,7,15,53,53,4
20 REM----UTTER G$ ROUTINE----
30 FOR UT=1 TO LEN G$
40 U$=MID$(G$,UT,1)
50 IF MID$(G$,UT+1,1)="," THEN 80
60 U$=U$+MID$(G$,UT+1,1)
70 UT=UT+1
80 UT=UT+1
90 U=VAL(U$)
100 GOSUB 140
110 NEXT UT
120 RETURN
130 REM---OUTPUT ONE CODE TO SPU----
140 OK=INP(251)
150 IF OK )31 THEN 140
160 OUT 251,U
170 OUT 251,0
180 RETURN
```



Speech Processor Unit — Port 'FB' S-80.

1 x 3.120MHz Crystal (not critical)	1 x SPO256 SPU (Radio Shack)
50 position card edge Con Archer 276-1566	1 x 220uF Elect Capacitor
3 x BC108 transistors or similar	1 x 100uF Elect Capacitor
Z5 - 1 x 74LS367	6 x 0.1 Disc Ceramics
Z2 - 1 x 74LS377	2 x 22pF Disc Ceramics
Z3 — 1 x 74LS30	2 x 0.022uF Disc Ceramics
Z1, Z4 — 2 x 74LS32	1 x 10uF Elec Capacitor
Z8 — 1 x 74LS75	2 x 33k Resistors
Z7 — 1 x LM386 Audio Amplifier	1 x 220 ohm Resistor
Z9 — 1 x 4W28 PTO Isolator	1 x 100k Resistor
3 x BC108	1 x 10k Trim Pot

Upon returning to the calling programme, this code must be executed.

OUT 251,1

Then code '1' is the code for a silent period. Any silent period code signifies to the SPU, the end of an utterance.

Incidentally, the code used in G$ in the above example will say "HELLO".

The programme listed below will enable the second operator to be put to use immediately, and is useful for establishing a vocabulary for him.

The programme allows you to:
TEST ALLPHONES, HEAR ALL ALLPHONE, CREATE WORDS AND TEST THEM AS YOU GO, LPRINT WORDS YOU FORM-TOGETHER WITH THE CODES, REPEAT WORDS ENTERED, AND CHANGE CODE.

If you start each word with decimal 90, it then allows you to type in the word to be coded. Entering a decimal 99, will cause the code entered so far to be uttered and then present a selection menu.

If an invalid code is entered, a spoken error message will be uttered. SOme people may find it mildly offensive, if this is so, change the code in line 150.

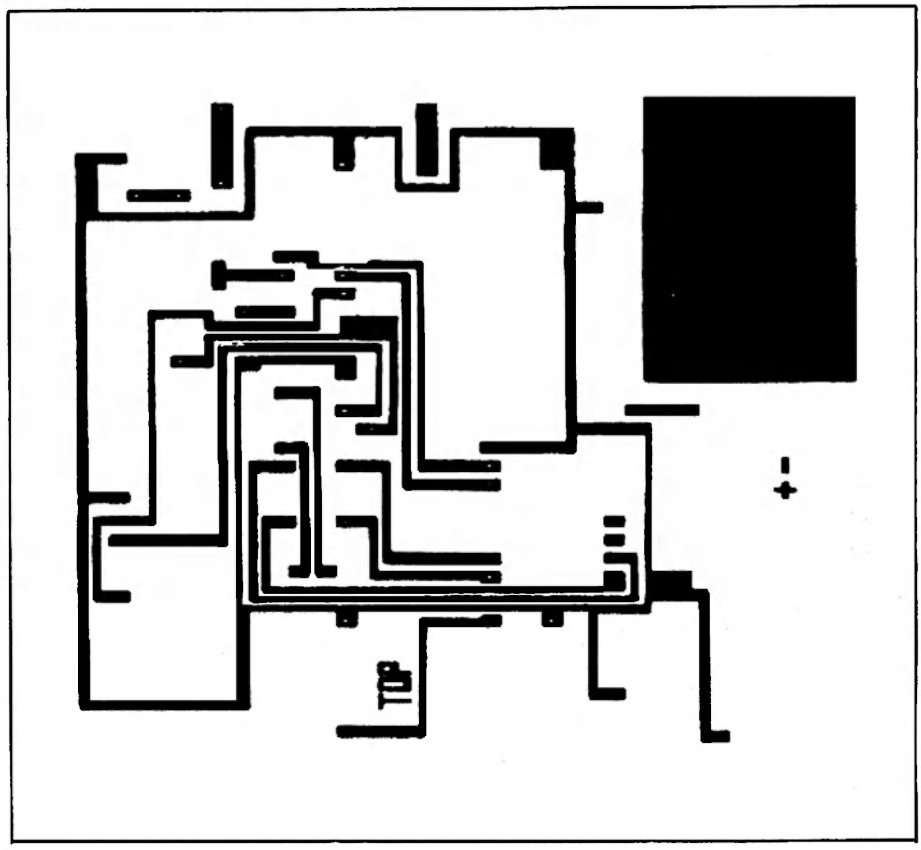
STARTING/STOPPING THE CASSETTE DRIVE

One of the four 'D' type latches in Z8 is used to start and stop the cassette, via the 4N28 opto isolator. The Q output will follow the D input whenever the C (clock) input is high.

To turn on the BC108, Q needs to go high and to do this we output a high on data lines D7 and D6 (OUT 251,192), this makes D and C inputs to Z8 high and the Q output will go high. To latch it in this condition we need to lower the clock input with OUT 251,128 and OUT 251,0 instructions.

To stop the cassette drive we need to output a high on D6 (C) and a low on D7 (D), ie — OUT 251,64.

```
5 ROUTINE TO TURN CASSETTE ON...
10 OUT 251,192
20 OUT 251,0
30 RETURN
35 ROUTINE TO TURN CASSETTE OFF...
40 OUT 251,64
50 RETURN
```

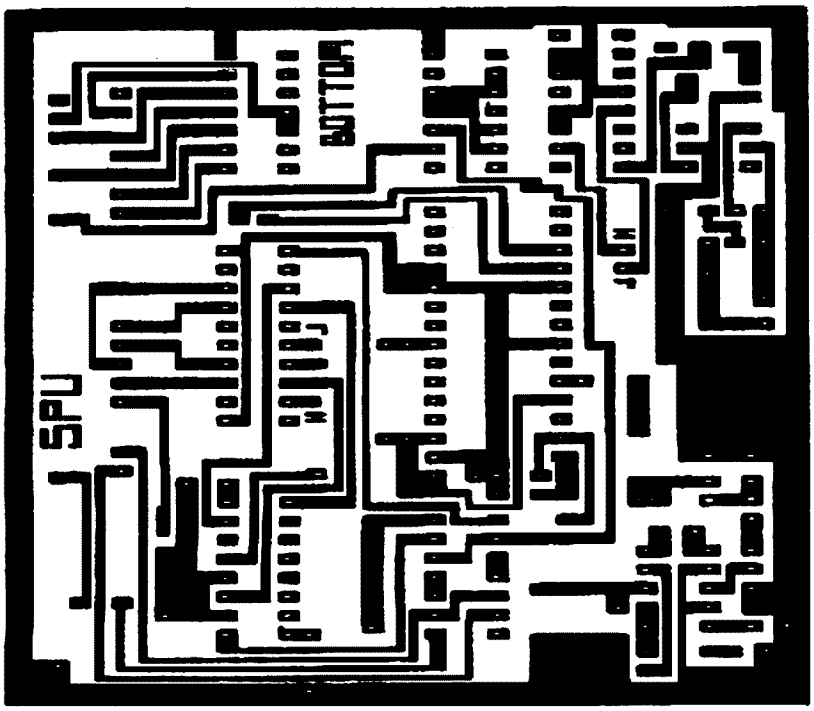


NOTES . . . . .

The prototype was built on veroboard and two subsequent ones built on PC boards. They can be mounted in a suitable box and connected to the micro, via the expansion unit edge connector. Mine is mounted in a box with a printer interface and the control, data and address lines paralleled to printer interface and the SPU.

One other thought, when the SPU was used in a satellite prediction programme; the voice slowed down more and more as the programme was developed. This was due to the fact that as more strings and variables were added to the programme. the time to access them increased. And, as the SPU part of the programme used strings to form the allphone codes for vocalisation, the rate at which codes were presented to the SPU decreased and it spoke in slow motion. To overcome this, I entered a machine language code above MEMTOP to output codes in real time to the SPU. The codes to be uttered were stripped from the strings in which they had been assembled and POKED into memory above MEMTOP and below the machine code, ie — the machine code started at 31500 and the codes to be output were stored at 31000 up. Upon first firing up the system, 31000 was input before hitting the RETURN to reserve the memory required.

AR




```
10 REM  PROGRAMME TO OUTPUT CODES TO THE 'SPO-256'
20 REM              TALKING SPEECH UNIT
30  REM                 ROY TAYLOR        26/4/85
40 REM  ------------------------------------------
50 REM              SIGNAL STATUS TABLE
60 REM------------------------------------------
70 REM  LRQ    SBY   INP(251)   BUFFER   STATUS
80 REM   0      1       16(31)   RT       LOAD - 'FREE
90 REM   0      0        0(15)   NT       LOAD - 'BUSY
100 REM 192  TURNS  CASSETTE  ON  AND 64 TURNS IT OFF
110 REM  ------------------------------------------
120 CLEAR 500:DIM T (500):DIM AL$(63):DIM NW$(500):CLS:GOSUB 520
130 CLS:G$="27,7,62,45,53,2": GOSUB 880
150 E$="63,30,45,37,27,12,12,13,1"
160 REM----GET CODE----------
165 P$="55,1,13,59,1,13,2,19,1,50,2,46,52,21,46,12,29,29,2,11,6,11,3,13,19,1":G$=P$: GOSUB 880
170 PRINT "ENTER 98 TO START EACH WORD, AND 99 ON TEST."
180 FOR K=1 TO 500:PRINT"STEP";K;:INPUT T(K):IF T(K))99 THEN250
190 IF T(K) =99 THEN 270
200 IF T(K)() 98 THEN 220
210 INPUT "WORD TO BE CODED"; NW$(K):NEXT K
220 IF T(K))63 THEN 250
230 IF T(K) =0 THEN 250
240 U=T(K):GOSUB 850:U=1:GOSUB 850:NEXT K
250 K=K-1:G$=E$:GOSUB 880:NEXT K
260 REM '----CODE TO SPU----------
270 FOR N=1 TO 500!U=T(N):IF U=99 THEN 290 ELSE IF U=98 THEN NEXT N
280 GOSUB 850: NEXT N
290 U=1:GOSUB 850
300 REN'----PRINT STEPS & CODE-----
310 CLS:FOR PO=1 TO K:IF T(PO)=98 THEN 330 ELSE IF T(PO)=99 THEN 350 ELSE PRINT "STEP";POT(PO),
320 NEXT PO
330 PRINT:PRINT NW$(PO),:NEXT PO
340 REN'----SELECT OPTION---------
350 PRINT:INPUT"REPLAY=R BACK=B CHANGE=C TEST=T ALLPHONES=A LPRINT=L";Q$
360 NT=0
370 IF Q$="A" THEN GOTO 720
380 IF Q$="T" THEN GOTO 760
390 IF Q$="R" THEN GOTO 270
400 IF Q$="B" THEN GOTO 450
410 IF Q$="C" THEN GOTO 470
420 IF Q$="L" THEN GOTO 480
430 G$=E$:GOSUB 880:GOTO 350
440 REN'----EXECUTE OPTION--------
450 INPUT "STEP NUMBER";NT:Q$="":IF NT=0 THEN K=K-1 ELSE K=NT-1
460 NEXT K
470 INPUT "STEP NUMBER";NT:Q$="":PRINT NT;:INPUT NC:T(NT)=NC:GOTO 270
480 FOR PO=1 TO K:IF T(PO)=98 THEN 510 ELSE IF T(PO)=99 THEN 500 ELSE LPRINTT(PO);",";
490 NEXT PO
500 LPRINT:GOTO 300
510 LPRINT:LPRINT NW$(PO),:NEXT PO
520 REM'----ALPHONES AND CODE--------
530 AL$(1)=" PA2 30ms":AL$(2)=" PA# 50ms":AL$(3)=" PA 4 100ms"
540 AL$(4)=" PA5 200ms":AL$(5)=" OY -LV":AL$(6)=" AY -LV":AL$ (7)=" *EH -SV": AL$(8)=" KK3"
```

Programme continued on page 14

What's in a Name?

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A description of what we are, or supposed to be as a fraternity, surfaces regularly in various magazines. It may be timely to take a more concerned look at ourselves in order to find the best possible term to fit our activities.

In this country, our first official designation was EXPERIMENTER. Between the years 1905 and 1925, WWI excepted, those who could convince the government they possessed sufficient knowledge, ability and integrity were issued with a licence, which allowed them to EXPERIMENT with WIRELESS. Some could **receive** only, not **transmit.**

It would be nice to add the tag COMMUNICATOR and or PATHFINDER to these very early few who found themselves infatuated with the miracle of being able to send signals through space without the aid of umbilical wires (telegraph). However, such titles best fit those who immediately followed this first stage of the art.

History shows that the first decade of the 20th century was given over largely to much 'cut and try' EXPERIMENTING. Initially, it was necessary to understand the function and effects of resonance, capacity, inductance, detection tuned circuits, amplification, etc. Also, the theory of 'feedback' was known and the vacuum tube still in its most primitive phase.

However, by the 1920s, the term PATHFINDER was applicable. The LF and MF spark transmission with limited range had given way to vacuum tube rigs capable of HF inter-continental daylight DX on QRP. Just like Edwin Armstrong's first step on the surface of the moon, which he described as 'small for him but big for mankind', so the PATHFINDERS now began to realise the potential of the world as an electronic global village.

About this time, the word AMATEUR began to displace EXPERIMENTER. Several reasons can be offered for this. Firstly, more time was spent in on air COMMUNICATING rather than in pure EXPERIMENTATION; MW broadcasting and commercially manufactured radios and component parts had put in an appearance and in Australia, the PMG had introduced the AMATEUR Operators Proficiency Certificate (AOPC). These 'firsts' helped to identify our activities in relation to the more corporate interests of others. By the year 1930, the word AMATEUR was our common nomenclature — and it is still with us to the present time, 60 years later.

Many argue that the word is low on definition, while others complain it carries the undesirable connotation of lacking skill and training. Let us pause here and examine this concept of our image. How amateur or professional, are we? It is only necessary to tune across the bands to realise we are more amateur than professional — mostly our operating techniques are below commercial standards. However, a minority are as professional as the art will allow and this goes for clubs and many other amateur activities, as well. By virtue of a variety of circumstances beyond his control, the AMATEUR must remain what he is — but always with one goal in mind, to be as PROFESSIONAL as is possible.

In reality, the post WWII amateur might be better described as a RADIO COMMUNICATOR or simply a COMMUNICATOR. It is generally accepted that the main occupation is no longer experimenting or pathfinding. Rather it is 'rag chewing' or chasing DX, using a repetitive structured form of A1 or A3 exchange. Again, the word COMMUNICATOR like AMATEUR, also lacks definition; there is a wide variety of the species, from broadcast disc jockeys to aircraft and other controllers, etc, etc.

Officially we are operators in the amateur service. Some would quite rightly ask, *"What service — and how many operators participate in it during their lifetime?"* Good question! To reply:

Continued on page 14

From previous page

```
550 AL$(9)=" PP":AL$(10)=" JH":AL$(11)=" nn1":AL$(12)="*IH -SV"
560 AL$(13)=" TT2":AL$(14)=" RR11-Res":AL$(15)="*AX -SV":AL$(16)=" MM"
570 AL$(17)=" TT1":AL$(18)=" DH1":AL$(19)="*IY -LV":AL$(20)="EY-LV"
580 AL$(21)=" DD1":AL$(22)=" UW1-LV":AL$(23)="*AO -SV"
590 AL$(24)="*AA -SV":AL$(25)=" YY2-Res":AL$(26)="*AE -SV":AL$(27)=" HH1"
600 AL$(28)=" BB1":AL$(29)="*TH":AL$(30)="*UH -SV":AL$(31)=" UW2-LV"
610 AL$(32)=" AW -LV"
620 AL$(33)=" DD2":AL$(34)=" GG3":AL$(35)=" VV":AL$(36)=" GG1"
630 AL$(37)=" SH":AL$(38)=" ZH":AL$(39)=" AR2-Res":AL$(40)="*FF"
640 AL$(41)=" KK2":AL$(42)=" KK1":AL$(43)=" ZZ":AL$(44)=" NG"
650 AL$(45)=" LL -Res":AL$(46)=" WH -Res":AL$(47)=" XR -RV":AL$(48)=" WH"
660 AL$(49)=" YY1 -Res":AL$(50)=" CH":AL$(51)=" ER1-RV":AL$(52)=" ER -RV"
670 AL$(53)=" OW -LV":AL$(54)=" DH2?":AL$(55)="*SS":AL$(56)=" NN2"
680 AL$(57)=" HH2":AL$(58)=" OR -RV":AL$(59)=" AR -RV"
690 AL$(60)=" YR -RV":AL$(61)=" GG2":AL$(62)=" EL -LV":AL$(63)=" BB2"
700 RETURN
710 REM----OUTPUT ALPHONES----------
720 CLS:FORG=1 TO 63:PRINT G;AL$(G),
730 U=G:GOSUB 850:U=4:GOSUB 850
740 FOR LL=1 TO 150:NEXT LL:IF G=4 THEN CLS
750 NEXT G:GOTO 300
760 REM----SINGLE SOUND TEST----------
770 CLS:FOR G=5 TO 63:PRINT G;AL$(G),:NEXT G
780 PRINT @ 938,"";
790 INPUT"99=return. CODE";CT
800 PRINT @ 938,"          ";:IF CT<64 THEN 820
810 IF CT=99 THEN 300
820 PRINT @ 941,AL$(CT);:FOR G=1 TO 3
830 U=CT:GOSUB 850:U=4:GOSUB 850
840 FOR TD=1 TO 200:NEXT TD:NEXTG:GOTO 780
850 REM----OUTPUT ONE CODE TO SPU--------
860 OK=INP(251):IF OK()31 THEN 860
870 OUT 251, U:OUT 251,0:RETURN
880 REM----UTTER G$----------
890 FOR UT=1 TO LEN(G$)
900 U$=MID$(G$,UT,1):IF MID$(G$,UT+1,1)=","THEN 920
910 U$=U$+MID$(G$,UT+1,1):UT=UT+1
920 UT=UT+1:U=VAL(U$):GOSUB 850:NEXT LT
930 RETURN
```

From previous page

WICEN is a State and Nationally organised body, but very, very few of the total VK amateur population ever become part of it. WICEN members spend time drilling themselves to cope with an emergency, which they hope will never happen — but if it does occur, they are likely to be the last called upon to render assistance anyway. Not exactly a role of substance! Those interested in third party traffic can now perform a community service as reciprocal arrangements exist with certain countries. Again, only a minority are ever likely to provide such a service, especially as inconsequential messages ONLY are allowed. When official approval is given, phone patching is another resource the amateur can offer to the public. But again, how many will provide the facility — very few!

The truth is that most VKs are only interested in 'doing their own private thing'. Is this attitude now good enough? The answer is NO, if we are to gain greater respect and recognition from the community at large.

The word AMATEUR, in radio, is traditionally associated with a quick willingness to assist others but, after 60 years with a title that does little for our status, many feel we are overdue for a new and more dignified label. This brings us to the nitty gritty of the whole discourse — what name??

The word EXPERIMENTER has been put forward again. In my view it is preferable to AMATEUR. Unfortunately it no longer realistically describes our main activities. Three recent suggestions are PRIVATE RADIO OPERATOR (PRO), PRIVATE RADIO STATION or PRIVATE RADIO SERVICE (PRS). Like the word AMATEUR, these titles are not very precise but, are certainly more dignified and broad enough to allow the operator to pursue his own particular interest, either that of community service or self concern.

The universal need now, is to find an upgraded title, one internationally acceptable, that does justice and which will carry us into the 21st century — quite likely a difficult and polemic exercise. *Any other suggestions???*

AR

VICTORIAN RAILWAYS INSTITUTE WIRELESS CLUB — VK3RI

Kevin Crockett VK3CKC
SECRETARY 1985
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Australia's Oldest Radio Club

The following is a brief history of the Victorian Railways Institute Wireless Club, which is 59 years old this year. A more complete history is being written to mark the 60th anniversary, next year.

An entry calling for persons interested in the formation of such a Club was posted in a Victorian Railways internal publication, THE WEEKLY NOTICE, for the weekending 18th May 1926. A meeting was subsequently held on 1st July 1926, and the Club was born.

The call sign VK3RI was taken out in 1927.

During the early days the Club broadcast music, and other items of interest, from the Clubrooms within the Flinders Street Station buildings. Various rooms have been used over the years, with the present location being Room 410. Dances, exhibitions, and raffles were held, the proceeds of these functions, together with member subscriptions, kept the Club in a healthy financial status. This was at the time when amateur radio was in its infancy and compared to today, was a novelty.

Around 1930, the Club was able to boast a membership in excess of 150 members.

During the war years, vital Club equipment was placed in storage, and many members joined the Armed Services and Merchant Navy. A few did not return.

Broadcasting of music by amateur stations was prohibited in the mid 1940s, which resulted in a decline in membership. The advent of solid state and transistor technology, and the Club's failure to keep pace, exacerbated the decline.

In 1954, the Club's antennas, which were attached to the clock tower above Elizabeth Street, were removed due to a Royal Visit by Queen Elizabeth II, as they were apparently an eyesore. Beauty, of course, is in the eye of the beholder, and obviously some were unable to appreciate the inherent beauty of such a construction. Henceforth, membership continued to decline.

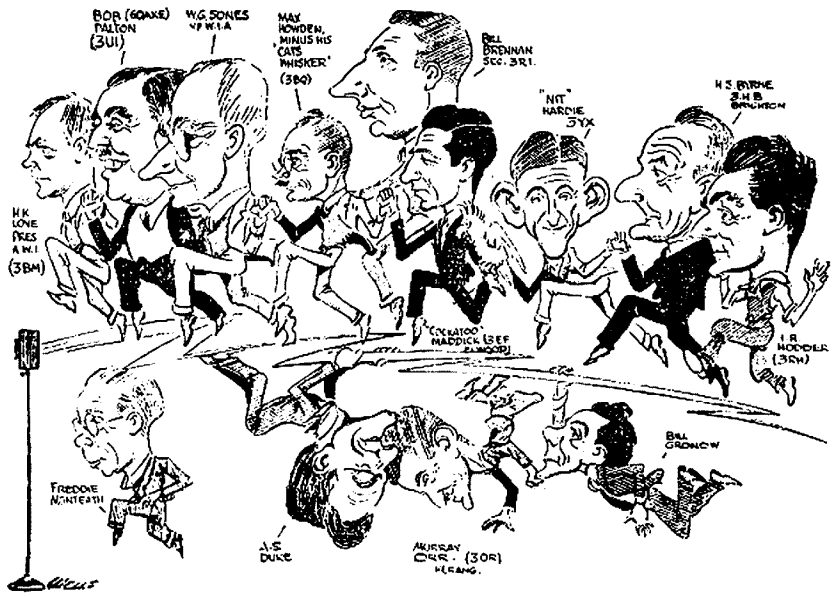
Eventually, in 1959, a plea went out to any technically qualified, and persons, who might make themselves available to an ailing club. Several transmitting and receiving items were built, and some minor items were purchased. However, the advent of television and consequent interference caused by amateur transmissions on nearby frequencies led to even further diminishing activity.

Dances, and the revenue derived from them ceased, and the advent of more modern transmitting modes (SSB and FM), made the Club's equipment obsolete. For various reasons the Club could not afford to purchase new equipment, and interest turned to tape recordings and music — not for transmitting.

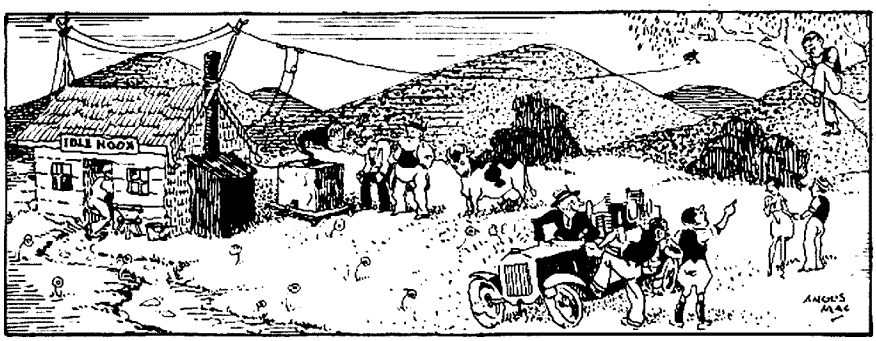
Whilst Club activities were minimal for the next 20 years, or so, regular meetings were still held which permitted the Club's existence to be continuous. Transmitting and receiving equipment remained set up and gathering dust. Capacitors dried out, and knowledge of what exactly was there became obscure.

The Club became but a mere shadow of it's former self. I can recall, upon entering the Clubroom in 1977, I felt as though I was passing through a 'time-warp'. There were things that I now know as valves, modulation transformers, carbon headphones, AR7s, and heterodyne frequency meters.

A turning point came for the Club in 1983. A few energetic enthusiasts decided to rejuvenate the Club. There was a sense of obligation to



Drawn by Herald-Sun Cartoonist, Wells, about 1930 and supplied courtesy VK3RI.



Three RIs Field Day at Selby on Kings Birthday Weekend, 1930. Supplied courtesy VK3RI.

the stalwarts that had held it together for so many years, but it was nearing the end and it would have been a pity for the oldest club in Australia just to disappear into history.

It was decided to participate in World Communications Day, 17th May 1983. The log book was not filled, but the day was well enjoyed by all who participated.

All obsolete equipment has been removed. Some was disposed of, some was auctioned to members, and some is awaiting possible restoration. There are many 78 RPM records from the 1930s era. Also many old radio and electronics magazines.

Modern equipment has now replaced the old gear. Antennas for the present are a random wire on HF and a 10 element rotatable beam on VHF. Club nets are held on Wednesday evenings at 0900 UTC, 3.585MHz, and Sunday mornings at 2315 UTC, 52.075MHz.

By the way, the next time you feel disposed towards complaining about electrical interference, spare a thought for this radio club. Dozens of horizontal antennas are outside the Clubrooms, all connected to 1500 volt arc generators. If the operator does not acknowledge your response to a CQ, it is because your signal is less than S9, and you can't be heard! !

As the Club is a Victorian Railways Institute (VRI) affiliated club it must operate under the constitution of the VRI. The VRI provides certain facilities for members, and membership of the Club is restricted to members, or associate members of the VRI. The VRI provided the current equipment used by the Club and their assistance is much appreciated.

This brief history, especially the early parts, has been extracted from the history books belonging to the Club. The full documentation, next year, will include newspaper reports and photographs.

The Victorian Railways Institute Wireless Club would like to congratulate the WIA, the oldest radio society in the world, on reaching its 75th birthday, but we are not too much younger.

If any reader has any historic data, recollections, or memorable association with the Club in its early years, evidence in the form of a letter would be appreciated for possible inclusion in the 60 year history publication. If you can help, please contact the writer at the above address or write to Room 118, Flinders Street Station Building, 223 Flinders Street, Melbourne, Vic. 3000.

AR

DIMENSIONS AND UNITS

Greg Baker L20282
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Have you ever wondered whether an equation you were using was correct? Or tried to distinguish between different versions of what should have been the same equation? Or even tried to remember an equation when you've lent your reference books to a friend studying for their licence?

There is a method, using what are known as "dimensions", which is of help in all these cases.

All physical quantities have dimensions. The four basic dimensions are mass, written [M], length [L], time [T], and charge [Q]. The dimensions of physical quantities can usually be expressed in terms of these four basic dimensions. If they cannot, they are said to be dimensionless.

Dimensions can sometimes be deduced from units but should not be confused with them. Thus, area has dimensions of length times length, ie [L] × [L] or [L^2] regardless of the units used to measure area. The units of area are usually metres^2 but could equally well be feet^2 or miles^2. Velocity always has dimensions length/unit time [L]/[T], ie [LT^{-1}] but may variously be measured in units of metres/second, feet/second, miles/hour, etc. Frequency is usually measured in units of Hertz (cycles/second) and has dimensions [ ]/[T], ie [T^{-1}]. Note that cycles is a dimensionless quantity and is written [ ]. It cannot be expressed in terms of the four basic dimensions.

Thus, being dimensionless does not preclude a quantity from having units. As we have seen, cycles has units, ie cycles, but no dimensions. Similarly, if we remember that there are 2π radians/cycle, the constant 2π can have units rads/cycle, but again no dimensions because radians and cycles have no dimensions.

The accompanying table shows, for some commonly used quantities, the dimensions and their SI units. Some may not be intuitively obvious, but a little practice using dimensions will show they are correct. At the end of this article the dimensions of capacitance are deduced to show the rationale behind it all.

All physical equations of general applicability must be dimensionally consistent. This means that the dimensions on the left hand side of an equation must be the same as those on the right hand side. Consider the equation

$f = c/\lambda$
where f is frequency (units: Hertz),
c is the speed of an electromagnetic wave in free space (metres/second), and
λ is wavelength (metres).
Now, f has dimensions $[T^{-1}]$, c has dimensions $[LT^{-1}]$ and λ has dimensions [L]. To be dimensionally consistent c/λ must have the same dimensions as f. The dimensions of c/λ are $[LT^{-1}]/[L]$, or $[T^{-1}]$ which *is* the same as for f. Hence the equation is consistent.

Note that when multiplying (or dividing) dimensions the normal rules for manipulating algebraic symbols apply. Thus, $[M] \times [M] = [M^2]$. However, adding a length to a length (or subtracting a length from a length) always gives us a length, so [L] + [L] = [L], and similarly with the other dimensions. These rules are used extensively in what follows and come naturally with a bit of practice.

There are several ways that amateur radio operators can use this information. One is, as a quick check, on the validity of equations. As times goes by we seem to need more and more to use equations which we have not derived ourselves, perhaps cannot derive ourselves. We need to accept other people's equations on faith. However, using this method we *can* make an elementary test of validity as well as get a better insight into the underlying physical principles.

For example, suppose we wanted to use the equation
$X = 2\pi fL$
where X is inductive reactance ($[ML^2T^{-1}Q^{-2}]$, ohms)
f is frequency ($[T^{-1}]$,Hertz), and
L is inductance ($[ML^2Q^{-2}]$, henry).
Dimensions on the right hand side, remembering that 2π is dimensionless, are
$[T^{-1}]\,[ML^2Q^{-2}]$
$= [ML^2T^{-1}Q^{-2}]$
which are the dimensions of reactance. Hence the equation *is* dimensionally consistent. While this does not tell us that the equation is correct, it *does* tell us that it is *not incorrect*.

Again, suppose we wanted to use the equation
$P = E^2R$
where P is power ($[ML^2T^{-3}]$, watts),
E is voltage ($[ML^2T^{-2}Q^{-1}]$, volts), and
R is resistance ($[ML^2T^{-1}Q^{-2}]$, ohms).
Dimensions on the right hand side
$= [ML^2T^{-2}Q^{-1}]^2\,[ML^2T^{-1}Q^{-2}]$
$= [M^3L^6T^{-5}Q^{-4}]$ which are *not* the dimensions of power. The equation is not dimensionally consistent and hence is not correct. It should not be used, unless you have carefully checked it and have good reasons. While it is true on occasion that dimensionally inconsistent equations are of use, they will be experimentally derived and will have a limited range of applicability. In these cases you should make yourself aware of the limitations and stay within them.

This approach can also be useful in distinguishing between variants of the one equation. Recently a VK2 friend drew my attention to an article with the two equations

$$h = \frac{\lambda}{4}\left\{1 + 20(ND)^{5/2}\,\frac{D}{(\lambda)^{1/2}}\right\}^{-1/2}$$

and

$$h = \frac{\lambda}{4}\left\{1 + 20(ND)^{5/2}\left[\frac{D}{\lambda}\right]^{-1/2}\right\}^{1/2}$$

There was no precise definition of the symbols, but it seemed that h was the height of a helical antenna, D the diameter of the helix, N the number of turns per unit length and λ was not specified at all but was presumably wavelength. Which formula, if either, is the one to use? One way to find out is to check for dimensional consistency. Now, h has dimensions [L], D [L], N $[L^{-1}]$ and λ [L]. The first equation has dimensions, showing both sides of the equation,

$$[L] = [L]\left\{1 + \left\{[L^{-1}][L]\right\}^{5/2}[L]/[L^{1/2}] - \right\}^{-1/2}$$
$$= [L]\left\{1 + [L^{1/2}]\right\}^{-1/2}$$

There are two things to be said. One is that this equation cannot be dimensionally consistent unless we *assume* the constant "1" has dimensions $[L^{1/2}]$. This is because we can only add like dimensions to like dimensions. If the "1" is a dimensionless constant, the equation is asking us to do something akin to adding apples to oranges. My approach here would not be to assume the "1" has dimensions $[L^{1/2}]$ but to try to check further. The other thing to say is that even if the "1" was confirmed as being a derived constant with dimension $[L^{1/2}]$, which it could be, the equation is still not dimensionally consistent because we get on the right hand side

$$[L]\,[L^{1/2}]^{-1/2} = [L^{3/4}]$$

which are not the dimensions of h. What of the other equation? It has dimensions

$$[L] = [L]\left\{1 + \left\{[L^{-1}][L]\right\}^{5/2}\right.$$
$$\left.\left\{\frac{[L]}{[L]}\right\}^{1/2}\right\}^{-1/2}$$
$$= [L]\left\{1 + [\ ]\right\}^{1/2}$$

since [ ] raised to any power is [ ]. Then, making the more reasonable assumption that "1" has dimensions [ ] we get [L] = [L].
This equation is thus dimensionally consistent and is the equation we should use, assuming the other to be the result of a typographical error perhaps.

Thus we have a quick way to tell whether or not an equation is incorrect. This knowledge can be a useful reassurance *before* cutting expensive co-axial cable, or soldering expensive fittings, or doing any of the other numerous tasks based on calculations from equations.

Another way you can use these ideas is to jog your memory when away from your reference books. For example, suppose you want the equation for the resonant frequency of an LC circuit and remember it has something to do with the inductance L and the capacitance C. The dimensions for f are $[T^{-1}]$, L are $[ML^2Q^{-2}]$ and C are $[M^{-1}L^{-2}T^2Q^2]$. Since there is no obvious way to *add* any combination of L and C, the equation you want will probably be of the form
$f = aL^bC^d$
where a, b and d are constants. We want b and d such that $[T^{-1}] = [ML^2Q^{-2}]^b\,[M^{-1}L^{-2}T^2Q^2]^d$
$= [M^bL^{2b}Q^{-2b}]\,[M^{-d}L^{-2d}T^{2d}Q^{2d}]$
$= [M^{b-d}L^{2b-2d}T^{2d}Q^{2d-2b}]$
Since there are no M, L, or Q dimensions on the left hand side, we must choose b and d such that these all vanish from the right hand side. Equating b = d achieves this, since any quantity raised to the power 0 becomes dimensionless, eg $[M^0] = [\ ]$.
We now have $[T^{-1}] = [T^{2d}]$. Hence 2d = -1, that is d = -½, and of course b = -½ as well. Putting these back into the formula we started with,

$$f = aL^{-1/2}C^{-1/2} = a/\sqrt{LC}.$$

At this stage you may recognise the equation and remember that $a = 1/2\pi$ and $f = 1/2\pi\sqrt{LC}$. If you don't remember that $a = 1/2\pi$, you are stuck because the method cannot help with dimensionless constants

So all right you say, I may not *remember* that C has dimensions $[M^{-1}L^{-2}T^2Q^2]$. Can it be deduced?

Remember first that capacitance is charge per volt, ie C = q/V. Intuitively we know this is true because if we were to experiment with a great heap of capacitors we would find that (i) for a constant voltage across the capacitors, the actual charge stored increases with capacitance, and (ii) for a constant charge on the capacitors, the capacitance decreases if we need a higher voltage across the capacitor to maintain that fixed charge. Now, voltage is the amount of work needed to be done moving a unit charge through an electric field, ie voltage = work/charge.

What is work, or more particularly, what are the dimensions of work? You should remember from your schooldays that work = force × distance, force = mass × acceleration, and that acceleration has dimensions length/time/time = $[LT^{-2}]$. Bringing all this together, the dimensions of force are $[M] \times [LT^{-2}] = [MLT^{-2}]$, of work therefore are $[MLT^{-2}]\,[L] = [ML^2T^{-2}]$ and thus of voltage are $[ML^2T^{-2}]/[Q] = [ML^2T^{-2}Q^{-1}]$. This then leads onto capacitance (charge/volt) as $[Q]/[ML^2T^{-2}Q^{-1}] = [M^{-1}L^{-2}T^2Q^2]$ as required.
That may look easy but it takes practice. You may not always get an answer without rushing for a reference book, but it's a lot of fun trying (yes, I am all right) and you will gain insights into the fundamental principles involved.
So there it is, a useful tool to help check on equations before their use and in some cases to derive valid equations. The method is not a panacea but it is another tool to use to come to grips with technical information.
As an exercise you might like to see whether the equations
$P = EI$
where P is power (watts), E is voltage (volts) and I is current (amps), and
$C = It/E^2$
where C is capacitance (farads), I is current (amps), t is time (seconds) and E is voltage (volts) are dimensionally consistent. You might also try to derive the equation for the time constant of an RL circuit knowing R and L are both involved.

DIMENSIONS AND UNITS OF SOME COMMONLY USED QUANTITIES

Quantity	*Dimensions*	*Units*
Capacitance	$M^{-1}L^{-2}T^2Q^2$	farad
Current	$T^{-1}Q$	ampere
Electric potential	$ML^2T^{-2}Q^{-1}$	volt
Energy	ML^2T^{-2}	joule
Frequency	T^{-1}	hertz
Inductance	ML^2Q^{-2}	henry
Permeability	MLQ^{-2}	henrys/metre
Permitivity	$M^{-1}L^{-3}T^2Q^2$	farads/metre
Power	ML^2T^{-3}	watt
Resistance, reactance, impedance	$ML^2T^{-1}Q^{-2}$	ohm
Wavelength	L	metre

AR

OH HUM! !
The world's first traffic lights exploded near Parliament Square, London, on 2nd January 1869. The lights had been erected for the benefit of Members of Parliament to be able to get to the House of Commons, but when a policeman threw the switch to turn them on, up they went!
Courtesy Angela Laurence

FM DETECTORS — HOW MUCH L and C?

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In the early days of FM the detector or "discriminator" consisted of an IF transformer with several tuned windings, a couple of diodes, and a few other components. Depending on the arrangement, the circuit was known as a Foster-Seeley discriminator, a ratio detector, perhaps a slope detector. In more recent times we have seen the evolution of a wide range of integrated circuits which contain an FM detector, usually preceded by amplifiers which may provide all the IF gain the receiver needs.

Most of these ICs are intended for use as TV sound IF systems at 4.5 or 5.5 MHz, or for broadcast FM receivers at their 10.7 MHz IF. Some, such as the CA3089E, are aimed also at the communications market and include muting circuits and outputs for signal level indicators.

On their own, none of these devices can detect FM! Essentially they respond to phase or amplitude changes with respect to the central carrier frequency, and such changes do not occur unless the circuit includes some kind of frequency sensitive element, commonly called a quadrature coil. To produce an undistorted audio output corresponding to the modulating signal, this element should have some parameter which varies in linear relationship to the frequency as it deviates over the occupied bandwidth.

REACTANCE

One such parameter is the reactance of a parallel-resonant tuned circuit. The reactance and resistance components which comprise the impedance of a parallel-resonant circuit are shown plotted against frequency in the figure, which is called a "universal selectivity curve". At the resonant frequency the reactance is zero and the resistance shows the familiar peak. At a frequency below resonance the reactance has a positive (ie inductive) peak, while at the same frequency difference above resonance there is a negative (or capacitive) peak. The region between these peaks is almost a straight line, particularly the portion symmetrical about the centre but not too close to either peak.

To be more quantitative, the reactance peaks are exactly half the resistance at resonance and occur at values of a (the detuning index) of ± 0.5 where a is defined by

$$a = Q \frac{\text{deviation from resonance } (\Delta f)}{\text{resonant frequency } (f_{res})}$$

and **Q** is the quality factor of the circuit, ie the ratio of reactance to series loss resistance **r**. Most commonly one sees **Q** given as $2\pi fL/r$, but it may equally well be expressed in terms of capacitive reactance and parallel loss resistance **R** by $Q = 2\pi fCR$.

The reactance curve is essentially linear for values of **a** between about ± 0.3, ie for linearity $Q\Delta f/f_{res}$ should not exceed 0.3. If then we define the optimum **Q** for an FM detector circuit to be that giving maximum output consistent with acceptably low distortion we have:

$$Q_{opt}\Delta f/f_{res} = 0.3 \text{ or } Q_{opt} = 0.3 f_{res}/\Delta f$$

Typically, for FM broadcasting, f_{res} is 10.7 MHz and Δf (the maximum deviation) is 75 kHz, so for broadcasting

$$Q_{opt} = \frac{0.3 \times 10700}{75} = 43$$

NARROW-BAND

But for our mobile FM communication systems the peak deviation is less than one-tenth that for broadcasting. Most repeaters are adjusted to start clipping when deviation exceeds about 7 kHz. Hence the optimum **Q** for a communications detector would be greater than 400.

Unfortunately, when we consult the application notes for our intended FM detector IC, they show typical values of L and C for a broadcast detector, but seldom indicate how they should be changed for use on narrow band systems. They commonly specify an unloaded coil **Q** (Q_U) of 50, which when shunted by the internal resistance between the relevant IC terminals drops to around the necessary 40 or so.

But for communications we want a loaded **Q** of 400 or more. We can't get it! No practical coil is that good. We can use a crystal, but then we may find the bandwidth is too narrow and have to experiment further. Besides, crystals are much more expensive than coils and capacitors, so the best we can do is to use a reasonably high **Q** circuit having **L/C** such that the circuit will not be too heavily loaded by the IC resistance. This can be determined as follows.

We noted before that $Q = 2\pi fCR$. If **R** is not only the parallel loss resistance of the coil, but also includes the IC resistance, this will give the working or loaded **Q**. A reasonable compromise is that $R_{ic} = 2R_Q$ where R_Q is the coil's own parallel loss resistance. So the effective parallel resistance becomes $R_{ic}/3$.

$$\text{Now } R_Q = \frac{Q_u}{2\pi fC} = \frac{R_{ic}}{2}$$

So

$$\frac{Q_u}{\pi fC} = R_{ic} \text{ or } C = \frac{Q_u}{\pi f R_{ic}}$$

This will then give an effective **Q** of ⅔ the coil unloaded **Q**. For the usual type of slug-tuned coil at 10.7 MHz a **Q** of 100 is a reasonable expectation, but what is R_{ic}? A figure of 3K is given in the data sheets for the LM373 and LM374, but for other IC types such as the CA3065, 3075, 3089 and 3189 it may be inferred from other data to be about 6K. For these more widely-used types we may therefore calculate that at 10.7 MHz

$$C = \frac{100 \times 10^3}{10.7\pi \times 6} = 500 \text{ pF (approx)}$$

And the inductance to resonate with this at 10.7 MHz works out to be about 0.44 microhenries.

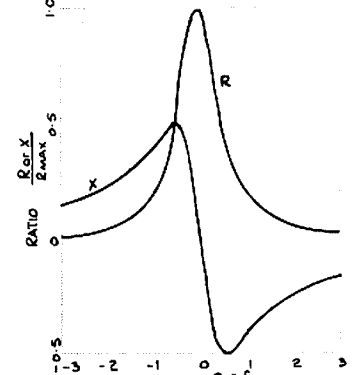
COIL DESIGN

For a "home-brew" design the most appropriate coil former is the Neosid moulded type of 3/16 inch (approx 5 mm) outside diameter housed in an aluminium can ½ inch (12.7 mm) square. Small iron dust cups are available which fit over the top of the winding, plus a similar ring below it, so that there is an almost fully-closed magnetic circuit around it, which is completed by the fine-thread ferrite slug inside the former. The near-closed magnetic circuit raises the **Q** by needing less turns for a given inductance, thereby reducing copper loss. There is a choice of slugs, the higher-frequency F29 or the low-frequency F16. At 10.7 MHz it makes little difference which is used.

Bases having 6 pins are part of the Neosid range. The former, as a first step, is glued into the base with a drop of epoxy cement. An iron dust ring is then slid down to the bottom of the former. The winding itself is about 9 turns of 28 AWG enamel and cotton covered wire wound by hand into a criss-cross pie formation above the ring, and held together by a drop of melted beeswax before the wire end is released. The two ends of the coil emerge over the ring, and are soldered to two of the base pins. The cup can now be fitted and the whole assembly mounted in the can and secured by bent-in tabs at the can edge.

The capacitor should be a stable high-Q type, preferably silver mica, but most of the plastic dielectric types are acceptable. Ceramics of low enough temperature coefficient will probably be rather large in physical size but may also be used. NP0 for preference, perhaps N100, but larger coefficients such as the popular N750 are not stable enough.

If you have built an FM receiver using an IC such as those mentioned, and for lack of any better information used the quadrature coil specified for FM broadcast or TV sound, you have probably found it produces much less audio than desired on narrow-band FM. Try the values suggested above and hear the difference. There is just one snag. It will now be too sharp to use for a broadcast detector!



CONCLUSIONS

From all the foregoing we may reach three conclusions as regards an IF of 10.7 MHz:

1 *For broadcast FM the loaded Q of the quadrature coil should not exceed about 40 or modulation peaks will be distorted.*
2 *For narrow-band FM is will be impossible to achieve a Q high enough to give distortion, unless perhaps a crystal is used instead of an LC circuit.*

3 To obtain maximum output from practical coils the L/C ratio must be such that the IC shunt resistance introduces relatively little extra loss to that of the coil. In practice this means C must be from several hundred to perhaps 1000 pF.

AR

To begin, select Auto 100,10 and enter on the first line that appears, say, a contest number, the date, signal strength, name, QTH, time, etc. You can select any number and it may be an advantage to chose other line numbers, say 5000 for VK5, 6000 for VK6 and so on. For example: *00100 VK5AHK: Your No 045 sig 5&9: My No 004 sig 5&8: 23.6.85: 0900: Karl*

Using the Auto' command, the line numbers appear automatically in any sequence as desired and as 184 characters can be stored on each line, there is ample space for log keeping, or for any other purposes such as, addresses and telephone numbers of friends and relatives. By the use of the Global Search command 'GX' any line of information can be retrieved instantly by asking for any character appearing on that line.

If the GX command GX/K/K/ is given for instance, then any line with a 'K' in it will be retrieved and displayed, one at a time, as the RETURN key is pressed.

To retrieve a particular line, you must choose not one character, but two or more, such as a name or call sign, or something specific in that line. Of course, if you want to recall all the South Australian call signs, ie VK5s, then the GX command GX/VK5/VK5/ should be given and all lines of information with VK5 stations would be recalled and displayed, one at a time, as the RETURN key is pressed.

A GX command, GX/JACK/JACK/ will cause all lines of information containing 'Jack' to be displayed.

Figure 1 displays a dummy list of contacts, as they may appear in a contest, and printed out in selected lines using the Global Search command. The first one shows selection by name, the second by date, and the third by number. Remember, this is done on this particular computer withour a programme but, by using the Global Search command facility.

The normal use of the GX command is for changing variables or characters in a programme, and the form, GX/KARL/TOM/ is used. Here Karl will be replaced with Tom as each Karl is searched for and displayed when the period '.' is pressed. However, no change occurs if the RETURN only is pressed.

For our application of the GX command, the period '.' is not used and therefore nothing will be lost, or changed, from the information on each line when being retrieved.

It is not necessary to enter two commands in the GX statement for our purpose, the form GX/KARL// is sufficient to retrieve and display a line with the name Karl in it.

On a 16k Bee, about 300 to 400 lines of information can be stored before running out of memory, but it depends on the amount of information included on each line.

The information can be saved in the usual way, either with cassettes or disks, when you run out of memory space.

I am not a contest operator and do not claim that the arrangement I have given, for contest log keeping, is the best, so I leave this for the individual to judge.

Happy Contest Beelogging!

AR

Hello, Hello!
On 28th January 1878, the worlds first switchboard was installed in Connecticut. Instead of answering the telephone by saying Hello, people said Ahoy! Ahoy!
Courtesy Angela Laurence.

Recently there have been some very simple, and interesting programnmes for the VIC computers, particularly for log and contest keeping, and I thought AR readers would be interested in a Microbee system which does not need a programme, yet it can retrieve and display any selected log as required.

Karl Saville VK5AHK
85%63 Main Street, Lobethal, SA. 5241

COMPUTER LOG PROGRAMME FOR A MICROBEE

```
00100 #1 VK5AHK:1230:YOUR #.012 RST 5&8:MY #.067:RST 5&9:2.1.85:KARL:TEN-TEC
00110 #2 VK5XT: 1240:YOUR #.534 RST 5&7:MY #.068 RST 5&9:2.2.85:JOHN:ICOM
00120 #3 VK5AJN:1250:YOUR #.643 RST 5&3:MY #.069 RST 5&7:2.3.85:REG:TS 500
00130 #4 VK5ACJ:1255:YOUR #.231 RST 5&9:MY #.070 RST 5&9:2.4.85:CLIFF:FT101
00140 #5 VK5UY:1310:YOUR #.102 RST 5&3:MY #.071 RST 5&5:2.5.85:RAY:TEN-TEC
00150 #6 VK5ABW:1320:YOUR #.222 RST 5&9:MY #.072 RST 5&8:2.6.85:BARRY:TS520
00160 #7 VK4ADK:1324:YOUR #.054 RST 5&6:MY #.073 RST 5&8:2.7.85.DAVE:FT107
00170 #8 VK3HT 1323:YOUR #.204 RST 5&9+:MY #.074 RST 5&9+:2.8.85:JACK:COLLINS
```

Figure 1.

```
Ready
>
>GX/JACK//

00170 #8 VK3HT 1323:YOUR #.204 RST 5&9+:MY #.074 RST 5&9+:2.8.85
:JACK:COLLINS


Ready
>GX/2.5.85//

00140 #5 VK5UY:1310:YOUR #.102 RST 5&3:MY #.071 RST 5&5:2.5.85:R
AY:TEN-TEC


Ready
>GX/VK5ACJ//

00130 #4 VK5ACJ:1255:YOUR #.231 RST 5&9:NY #.070 RST 5&9:2.4.85:
CLIFF:FT101


Ready
>
>GX/#8//

00170 #8 VK3HT 1323:YOUR #.204 RST 5&9+:MY #.074 RST 5&9+:2.8.85
:JACK:COLLINS
```

IF YOU CAN'T BEAT THEM — JOIN THEM!

Being the mother of an amateur has certain disadvantages, but when mother is an amateur too — well, it's not so bad, and such things, as leaving tools lying on the dining-room table, and spilling acid on the carpet pass almost without notice!

Mrs E L Hutchins VK3HM, is the mother of a grown-up family, which includes VK3HL, who has been on the air for many years. About two years ago, Mrs Hutchins, having learned the code, used to copy stations on the receiver in VK3HL's shack. Under her son's tuition, Mrs Hutchins sat for, and attained the AOCP, thus becoming one of the first lady transmitters in Australia.

She has the distinction of being the only woman in Australia to have worked two-way communication stations in all continents. This performance was achieved in less than four months from the time VK3HM first went on-air, and makes her eligible for the WAC Club, whose world-wide membership numbers less than 300. Most operating is on the 20-metre band.

VK3HM has all the multitudinary duties of a country home to attend to, but she usually manages to get on the air between 3 and 4pm, and again from about 8.30 in the evening. She has been known to still be on-air at dawn, chasing the elusive DX.

Condensed from Wireless Weekly, 3rd April 1931

MORSE CODE ON THE VZ200

A previous article described an adaptor to operate RTTY on the VZ200 computer. The adapter has now been modified to include Morse code.

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

Expansion of the programme resident in the EPROM and minor changes to the wiring, have expanded the VZ200 RTTY adaptor to include encoding and decoding of Morse code. Morse speed can be varied over a range of approximately five to 35 words per minute. Resident messages, buffer storage and split screen operation, all used on RTTY, are also available for Morse operation.

HARDWARE CHANGES

To interface for Morse code, the 8251 USART functions DSR and DTR are used as one bit input and output ports respectively. DSR is simply wired in parallel with the existing data input (RXD). DTR is wired via a spare gate (V6-2), which is used to key the tone output from gate (U5-3). The circuit changes are illustrated in Figure 1.

For Morse code, the output tone is set at 2125Hz by the software and this can be used to feed the speech input of a transmitter. In a single side-band transmitter, CW transmission (A1) is generated and on a transmitter where carrier is not suppressed, MCM transmission (A2 or F2) is generated. Of course the latter is only permissible above 52MHz.

MORSE FORMAT

Morse format is based on the following:

Dash = three dots length
Space between dot or dash elements = one dot length
Space between characters = three dots length
Space between words = seven dots length

Speed is controlled by a selection code of one to eight and for the two lowest speeds (below 10 WPM), the spacing is increased to the following:
Space between characters = five dots length
Space between words = 13 dots length

There are a number of special Morse characters which are not available on the keyboard and not available as printed characters. These have been equated to available characters as follows:
Error = asterisk (*)
Double dash = dash (—)
Wait = plus (+)
Start of message = less than (<)
End of message = equals (=)
End of work = at (@)

Error is transmitted as six dots, instead of the standard eight, because six elements per Morse character is the maximum the system can process.

Morse characters are generated from a look-up table, one byte per character. Bits two to seven are used to store the individual elements of a character, zero representing no element or a dot and one representing a dash. Elements are justified left, with the last element sent, always in bit seven. The numeric value formed by this is added to the number of elements in the character and the sum is the value stored in the look-up table. For up to five element characters, it is an easy matter to extract the number of elements from bits zero to two and the dots and dashes elements from bits three to seven. For six element characters, there is an overlap on bit 2 and summing causes bit carry on four of these (parenthesis, comma, colon, and semi-colon). To detect these is a bit tricky. The logic is to look for a one in either bits four or five and binary 010 in bits zero to two. If this logic is satisfied, the number of elements is assumed to be six and six is subtracted from the byte value to obtain the element format in bits two to seven.

Some examples of look-up table coding are shown in Figure 2.

OPERATION

Morse can be sent on line, direct from the keyboard and characters are encoded at the selected speed by the software. In this method of operation, character and word spacing are

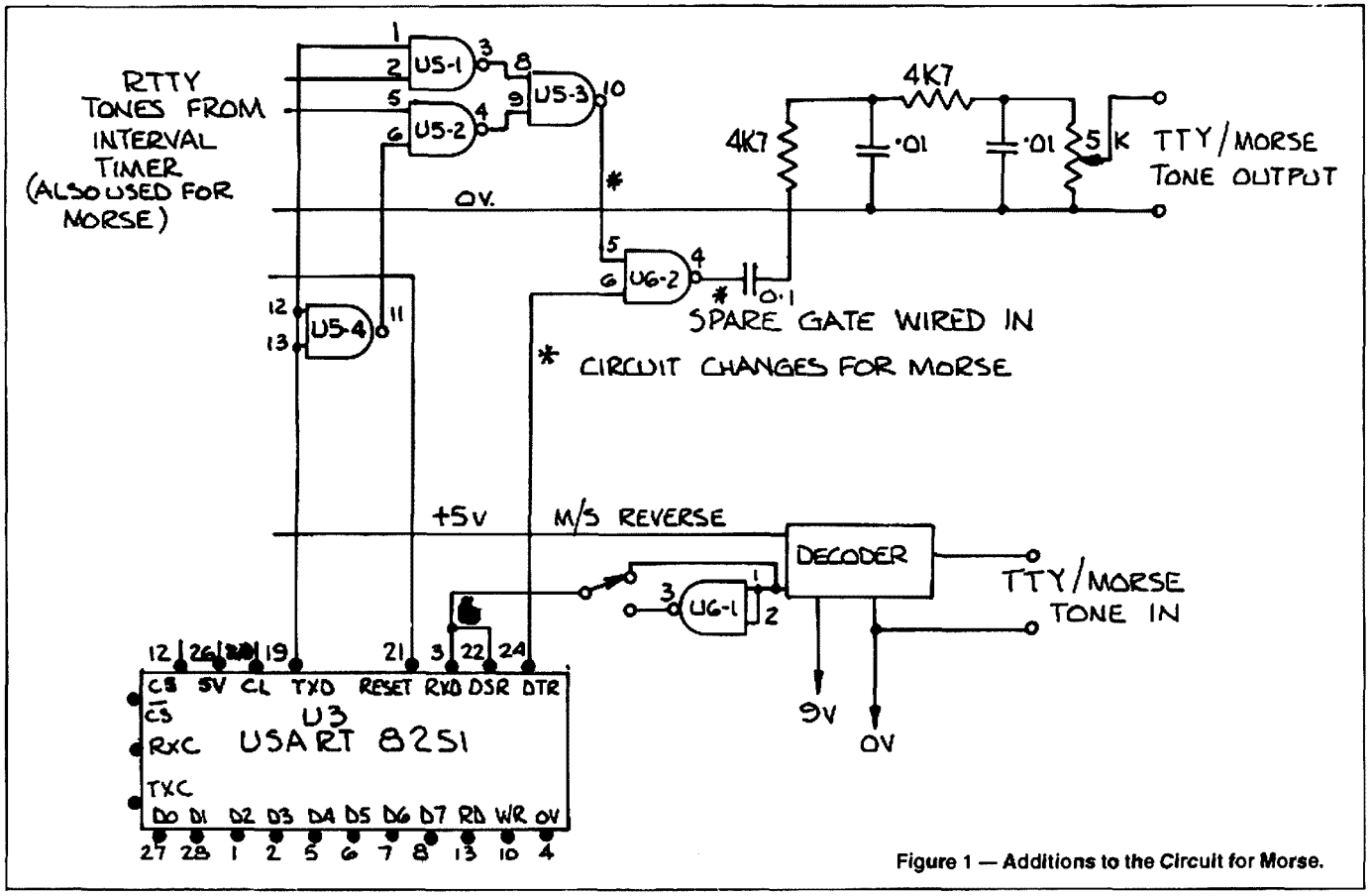


Figure 1 — Additions to the Circuit for Morse.

Figure 2 — Examples of Table Coding for Morse.

MORSE CODE	BINARY VALUE (BIT No)	HEX VALUE
	76543210	
Letter B — . . .	00010100	14
	code 4 elements	
Interrogation (?) . . — — . .	00110000	30
	code	
	+ 110	6
	6 elements	
	= 00110110	36
Comma (,) — — . . — —	11001100	CC
	code	
	+ 110	6
	6 elements	
	= 11010010	D2
	↗ ↗ ↗ Carry of Bit 2 into Bits 3 & 4	

determined by the time taken to move from one key to the next and, it seems to the writer, that a lot of practice would be needed to control the spacing correctly.

Morse is better sent by releasing the message from a pre-loaded buffer so that character and word spacing is accurately controlled by the computer. Using this method of operation, when communicating with another station, it is necessary to load the buffer at the same time as the other station is being received. This is common practice with RTTY operators using computers with split screen displays.

For RTTY, characters are encoded and decoded by the 8251 USART and the device is addressed by the computer for a very small proportion of the time. The rest of the time is available for other purposes including accessing the keyboard and loading the buffer, hence there is no problem in preparing the signal for transmission whilst the received signal is being decoded.

For Morse code, characters are encoded and decoded by timing loops called in by the main programme routine and while this is going on, access to the keyboard to load the buffer is denied. The obvious answer to the problem is to access the keyboard via an interrupt, however to make things difficult, the Z80 interrupt is already used by the VZ200 operating system. This calls an interrupt every 20 milliseconds on video vertical retrace.

Steve Onley described a method to make use of this 20 milli-second interrupt in Electronics Today International (ETI), May 1985. Your own interrupt is placed in series with that of the operating system so that it too can interrupt the main programme loop every 20 milli-seconds. The method described has been adopted for accessing the keyboard and loading the buffer in Morse operation.

Owing to peculiarities of the VZ200 system, keyboard access using this interrupt inhibits repetitive generation of a character, that is, you have to press the key each time a character is to be generated. This is not such a bad thing as it stops generation of more than one character if the key is accidentally pressed too long. The reason for the peculiarity is not clear as we do not have access to information on the VZ200 operating system.

The interrupt system works very well for loading the buffer, but a problem was found in attempting to generate Morse characters this way in real time. Because of the peculiarity discussed, a key pressed too soon, before the previous character is finished being transmitted, fails to generate a character and locks in this condition until the key is released and pressed again at the end of the previous character. Because of this problem, the interrupt is only used for loading the buffer and in all other modes of operation, the keyboard is accessed from the main programme loop. Using this method of access, the key can be kept pressed and the new character is sent, following a three dot length space, at the end of the previous character.

MEMORY

The combined RTTY and Morse programme package fully fills the 4k byte EPROM. A certain amount of programme trimming and rearrangement had to be carried out to fit it in. The programme is loaded in memory COO3H to CFF9H. RAM space used is 8000H to 8900H.

Based on information given by Jim Rowe in ETI, July 1985, the memory allocation should be suitable for both the VZ300 and VZ200 computers. A VZ300 has not been available to check it out, but the adaptor is expected to also work on the VZ300. There appears to be a change in clock frequency in the VZ300 from 3.580 to 3.540MHz. This will cause a shift In Baud rate and tone frequencies, but insufficient to be of significance.

CONCLUSION

The unit works very well on both RTTY and Morse code. The Morse decodes over a wide tolerance in reference to the speed selected. The writer was surprised how well it manages to decode hand sent Morse in which timing is not precisely defined. Noise interference is reduced by feeding the input signal via the RTTY decoder filters, but it does not perform as well as the human ear in separating Morse from noise. No doubt this could be improved if frequency shift keying were used.

Morse sent from the buffer sounds copperplate, as one would expect fully controlled by the computer. On line from the keyboard, the writer found it difficult to maintain constant character spacing, but this is probably a matter of practice on the keyboard. **AR**

To convert a CB 'Station Master' to 80 metres for minimum dollars, you will need a piece of PVC pipe, about 10m of copper wire and a tube of 'Araldite'.

Portable Antenna for Eighty Metres

Keith Rehe VK4KAW
7 Guardsman Avenue, Alexandra Hills, Qld. 4161

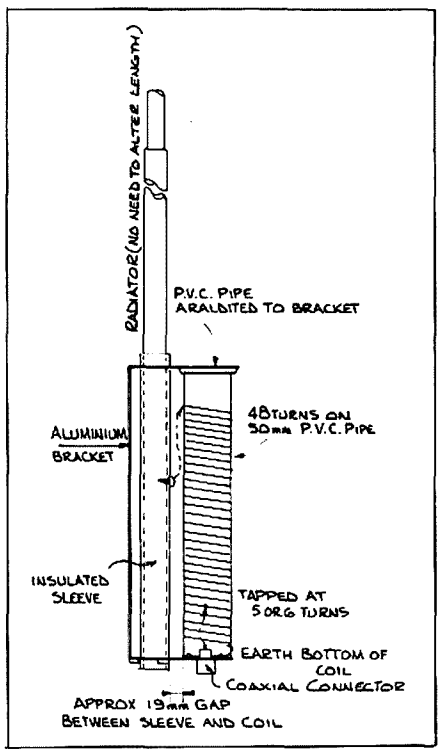
Remove the original coil by drilling out the pop rivets that hold it and then wind a new coil on the PVC pipe former.

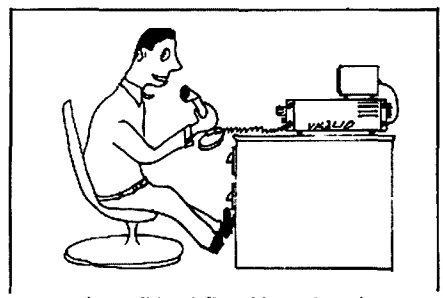
The completed antenna resonated 1:1 on 3.545MHz and was 1.2:1 on 3.620. The radiator breaks down to about four feet (1m), and can be stored in a caravan or car boot with ease.

It can be mounted at ground level or on the car or caravan, ensuring you keep the coil clear of metal surfaces.

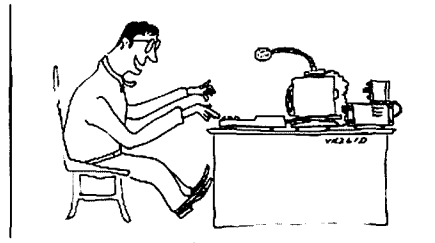
Technical Editor's Note:
Some adjustment of the number of turns on the coil, the tapping point, or the length of the radiator, may be needed. These will be dependant on the actual materials used to make the coil. The wire used for the coil should have a diameter in the region of 1.5mm, in order to minimise losses.

AR





'. . . and; confidentially OM — Just between you and I . . .' — VK2COP.



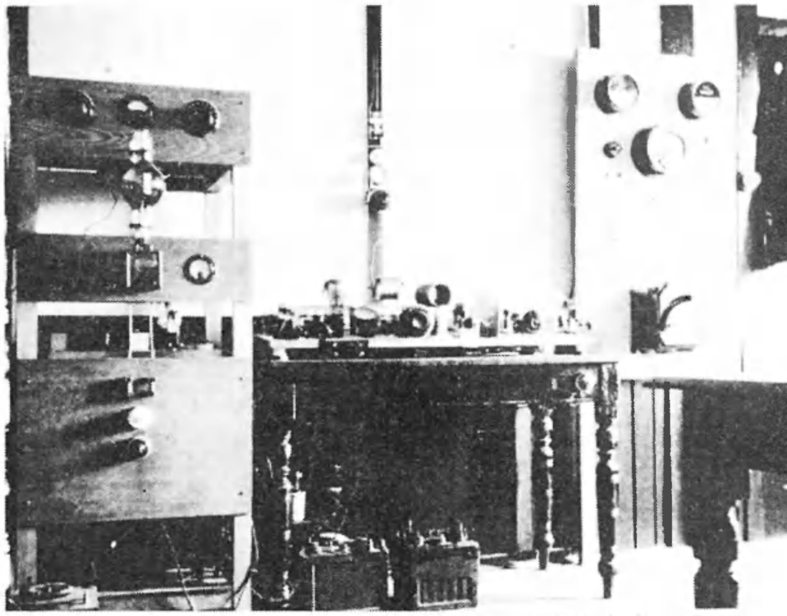
"My computer says it doesn't want to 'talk' to *your* computer, OM!" — VK2COP.

"QSL Direct?! Listen OM — I haven't paid off the rig yet!" — VK2COP.

TENTERFIELD OLD TIMER

Recently, Russell Watt VK2WT was featured in the TENTERFIELD STAR, explaining the benefits of a lifetime hobby in amateur radio.

Russell was granted a Certificate of Proficiency in Radio-Telegraphy in 1925, and over the years, has kept many 'bits and pieces' from the early days. He was pleased to discover he still had a valve of the type used in the radio receiver on the cover of Amateur Radio, May 1985. (See photo 1).

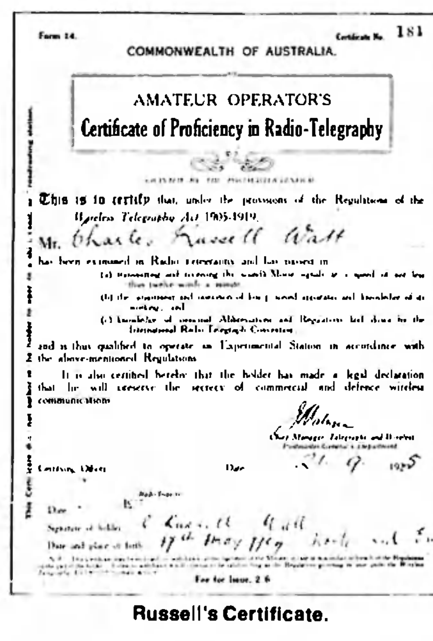


—— An early photograph of Russell's 'shack'. Note the batteries under the table.

Russell's QSL cards, through the years.

Russell, aged 21, poses for the identification photograph on the back of his Certificate.

Photographs courtesy Tenterfield Star



Form 14. Certificate No. 181

COMMONWEALTH OF AUSTRALIA.

AMATEUR OPERATOR'S

Certificate of Proficiency in Radio-Telegraphy

This is to certify that, under the provisions of the Regulations of the Wireless Telegraphy Act 1905-1919,

Mr. Charles Russell Watt

has been examined in Radio Telegraphy and has passed in

(a) ...

(b) ...

(c) ...

and is thus qualified to operate an Experimental Station in accordance with the above-mentioned Regulations.

It is also certified hereby that the holder has made a legal declaration that he will preserve the secrecy of commercial and defence wireless communications.

Fee for Issue, 2/6

Russell's Certificate.

UNDERGROUND WAVES

Special thanks to Bob Staden VK4ZSK, Wolf Getto, Marian Dent and the PR Department of Mount Isa Mines for their help in compiling this article.

Steve Stephens VK4KHQ
PO Box 2754, Mt Isa, Qld. 4825

This article is an insight to underground communications in a deep mine.

Mount Isa is situated in north west Queensland, at 139 degrees 30 minutes east and 20 degrees 45 minutes south. The city has a population of 25,500 and 32 of these are licenced radio amateurs.

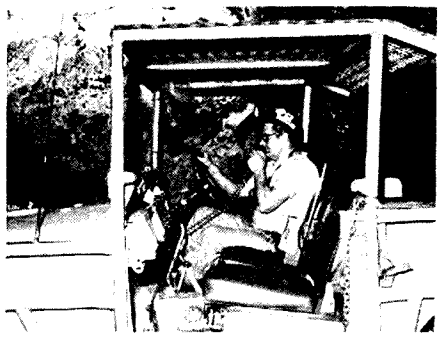
The mine itself, employs 4860 people and is the biggest producer of copper in Australia and the biggest combined silver, lead, zinc mine in the world. It is also the operator of, what could be, the longest antenna in the world. The mine's surface area covers more than 10 square kilometres, and underground, there is over 460 kilometres of road and 200 kilometres of rail tracks.

To control this organisation, there are 11 radio networks including, one low frequency, four HF, three VHF low band, four VHF high band and four UHF channels. The surface fleet consists of more than 400 vehicles from quarter tonne utilities to 90 tonne off-highway dump trucks. About 60 percent of these vehicles are co-ordinated by full time base station radio operators within the transport and warehouse sections.

Mount Isa mine looking north. The lease is west of the railway line, city to the right.

There are three major shafts, which convey men and supplies to the underground workings and these use high band VHF for voice communications between the cage (which carries the gear), and the winder driver, who operates the massive winding motors in the headframe. The R62 shaft main cage travels at more than 40 kph and to avoid accidents, several continuous tone oscillators monitor the failsafe mechanisms and trigger alarms or trip the drive system, in the event of a failure. Induction coils, coupled to the 44mm diameter steel winder ropes transmit data in the 125-180kHz LF band, to indicate such things as cage door positions, and other proximity switch positions to the winder driver. He also has an electric calling system which enables men on any of the 19 main levels, which are 58 metres apart, to call the main or auxiliary cages.

Until recently, tourists were taken on underground tours and upon arriving at a level, were driven by modified diesel four wheel drive,



A supervisor in a modified four wheel drive vehicle underground.

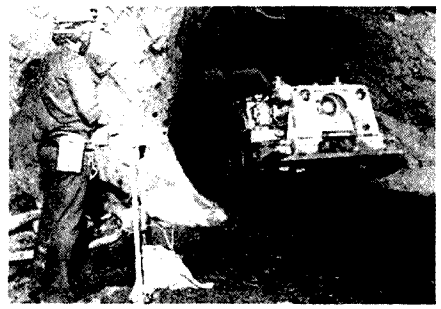
to see the mine in action. Unfortunately, these tours were stopped due to essential cost cutting measures brought on by low metal prices and several other outside factors.

Ore is drilled and blasted, then transported by 10 metre long, 20 tonne load-haul-dump units in 4.7 cubic metre mouthfuls to tipples, which are chutes allowing the ore to flow down to the next major transport drive below the production level. Two of these megaliths have been converted for remote use by UHF radio control for operation in hazardous areas. They use 14 channel, FSK modulated, pedestal mounted transmitters, which give full control of direction, speed and bucket operation, enabling the operator to 'muck out' the bottom of stopes, where there is a danger of sudden rock falls. When the unit is brought back to a safe area, the remote control gear is bypassed and the unit is then driven normally to discharge the ore in the tipple. Many underground vehicles are fitted with VHF low band transceivers and communicate via the longest antenna on earth . . . 15,000 metres of Radiax, mounted overhead in major drives and crosscuts. Radiax is similar in construction to low loss, rigid coaxial cable except, the crests of the outer, corrugated copper conductor has gaps machined out which allows some RF radiation along its entire length. This system allows both simplex and duplex two-way communication between vehicles, supervisors, haulage trains and the central train control room.

Small electric locomotives, called Mules, haul gear around the levels and their drivers use Motorola hand-helds with rubber antennas. Considering the environment and general operating conditions, the radios are amazingly forgiving. I wouldn't expect my trusty amateur hand-held to last a full shift at the mercy of the mine. Because of severe conditions existing underground, all radios have to be virtually waterproof and withstand prolonged high temperatures and vibration, not to mention the odd falling rock.

Generally, once you travel more than 50 metres from the Radiax, very little useful reflection occurs and communications are rapidly lost. Recently, tests have been carried out using UHF hand-helds and similar radios. This is just one of the avenues which the radio section personnel are exploring.

There are three main rail haulage levels and a typical example has one control room operator and four trains, each with two 20 tonne electric



A radio-controlled load-haul-dump unit 'mucking out' a stope.

locomotives and 15 trucks, hauling 250 tonnes of ore every 15 minutes. Ore discharged from the trucks flows to the crushers on level 20, 1055 metres below the surface. After primary and secondary crushing, the ore is hoisted by 30 tonne skips and conveyed to the storage bins at the surface where it is processed.

Isa mine is actually two separate mines, one producing copper and the other lead, silver and zinc. The two ore streams are mined, hauled, crushed, hoisted and concentrated separately and conveyed to their respective smelters, which are almost side by side. In the copper smelter, there are two, 80 tonne overhead cranes above the converters and another two over the anode furnaces. The crane chasers and supervisors guide the crane drivers with one watt, VHF hand-helds, during transfer operations.

The mine has its own weather station, which tracks daily meteorological balloon flights. These have UHF radio Sonde equipment attached and transmit atmospheric pressure, temperature and moisture content telemetry. The balloon is tracked until it bursts at about 50,000 feet (15,250 m), which is above the tropopause and international flight paths. There are also three sulphur dioxide monitors around the city with UHF telemetry transmitters, two of which are solar powered and considered very reliable, after many years of operation. Information from these, and 10 hard-wired monitor stations, feed a computer which provides a summary of air quality control and updates every five minutes.

By now, members can imagine the size of the annual licence renewal bill, which is in excess of $18,000!

In March 1978, the new 270 metre lead smelter stack was completed and the local amateur group drooled as they imagined what 2 metres coverage would be like from the top. The transport frequency radio was remote linked to the top of the stack but, due to limited access and lightening strikes, it is to be relocated. I believe it is the highest VHF antenna in the southern hemisphere. Unfortunately, we still cannot receive VK4RMI in Mount Isa, either.

There are more than 250 radios used on the lease including paging systems, railway marshalling, power station operation, fire, ambulance and security, plus several other small, stand-alone systems, so living with a scanner is an entertaining experience, 24 hours a day.

SAMUEL FINLEY BREESE MORSE AND HIS CODE

The first message transmitted over a telegraph line between Baltimore and Washington, in the United States, using Morse code, was "What has God wrought?"

Photograph courtesy Telecom Australia

There has been other telegraph systems before Morse, in particular the Englishman, Charles Wheatstone, developed a system using the deflections of a needle, which was used in railway signalling.

Both Wheatstone and Morse were indebted for their basic ideas to the American, Joseph Henry, who did not patent his inventions. There were two factors that made Morse's system different and led to its acceptance universally.

Firstly, Morse's ability to lobby the US Congress and convince them to pay for the construction of the first commercial telegraph line, and secondly the simplicity and ease of his code.

Skilled telegraphists were able to send messages at up to 30 words per minute.

Morse's basic telegraph system was extremely simple, with the telegraphists opening or closing a switch (key) to send electricity from a battery along the telegraph line. The return path for the current was through the ground. At the receiving end, the pulses of current operated a pen, which marked a strip of paper, later known as 'Ticker Tape', when current was present.

The, telegraphists found they could spell out the message just listening to the sound the pen made, and eventually the marker was replaced by a mechanism to amplify the sound. The problem was, how to use these pulses of electric current to represent the letters of the alphabet and to spell out a message.

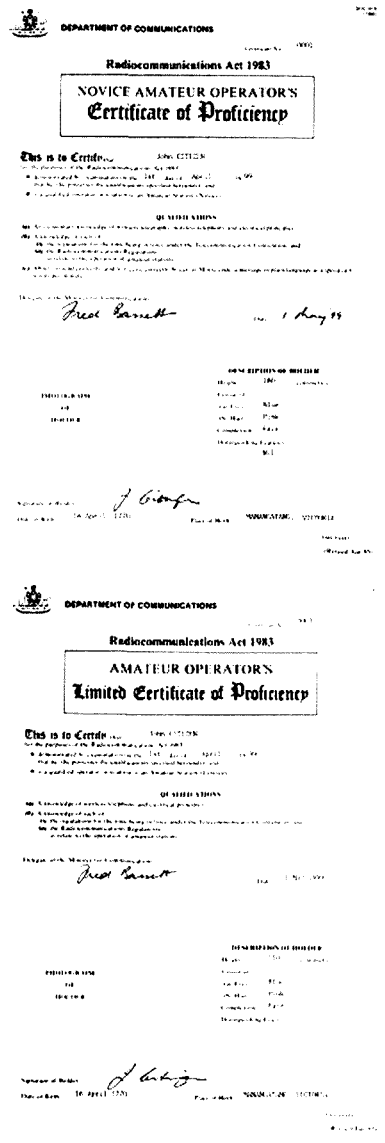
The *heart of Morse's invention* was his *decision* to use two different kinds of electrical pulse, one short and one long, a dot and a dash. By combining these two kinds of pulses, it was possible to represent every letter of the alphabet by a code of four pulses or less.

Morse gave the letters which were most frequently used the shortest codes. In this way, the number of pulses sent to communicate an average sentence in English, could be sent to a minimum. This is why the letter E, the most commonly used in the English language, was given a single dot.

The most common letter T got a single dash. Less common letters were made combinations of dots and dashes. Numerals and punctuation marks were made up of combinations of five or six pulses respectively. Morse also set the rules that a dash was to last as long as three dots, a space as long as one dot was to be left between the pulses, making up the same letter. He also ruled a space as long as one dash was to be left between different letters and a space as long as five dots was left between different words.

AR

Certificates Issued by DOC



DEPARTMENT OF COMMUNICATIONS

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Supplied by Jim Linton VK3PC

DIGITAL TO REPLACE MORSE IN MARITIME DISTRESS COMMUNICATIONS

Jim Linton VK3PC
4 Ansett Cresent, Forest Hill, Vic. 3131.

Since early this century, ships have used Morse Code for Distress signals but, that will end when computer-age technology is introduced in the next decade.

The International Maritime Organisation (IMO) plans to adopt automatic digital systems. Rod Harris, a senior radio communications engineer with the Department of Transport, said it was planned to replace Morse code under a world-wide review called 'The Future Global Maritime Distress and Safety System'.

Tentatively the new system will be fully operational in 1996, with a phase-in period beginning about 1990.

The new system basically means that someone will simply press the panic button to automatically send a distress call, including the ship's exact position. It would no longer be necessary for the radio operator to pound a Morse key to send out SOS. Operators would also be relieved from being by the radio 24 hours a day, in case a distress call is heard, as receivers will automatically scan a number of distress frequencies.

Maritime communications is one of the last to replace Morse with more modern systems.

Samuel Morse developed the code in 1832 and publicly demonstrated that messages could be sent electrically in 1844, when he opened a telegraph line joining Baltimore and Washington.The code rapidly gained use as telegraphs spanned continents, crossed ocean floors and wireless telegraphy was developed.

Australia's first telegraph linked Melbourne with nearby Williamstown port in 1854. Progressively, it linked the Australian continent, east with west and Adelaide with Darwin via the overland telegraph line.

Australia was first linked with the outside world via a cable between Darwin and Java in 1872, then to New Zealand in 1876. Other cables followed later.

Wireless telegraphy communication with England began in 1918 . . . 12 years earlier, Tasmania was

linked with the mainland by wireless Morse.

It took about 100 years for the teleprinter to make Morse telegraph redundant, and its use by wireless telegraphy has been steadily declining throughout the world.

The Overseas Telecommunications Commission of Australia (OTC), closed its last Morse telegram link, with Lord Howe Island, in 1975. Radio teleprinter, improved high frequency radio systems, better submarine cables and satellites have all made Morse obsolete for OTC telegram operations. However, OTC, through its coastal radio service for ships at sea, still uses the code.

Harold Jones, of Sydney Radio VIS, said that since the advent of the telex on radio had come into its own in the last decade, there has been a steady decline in Morse. He said there were a greater number of ships each year being fitted with telex, which is quicker and cheaper, and gives vessels direct contact with their offices.

Other factors leading to the reduction in Morse are better radio-telephone facilities, satellites, and also fewer ships, particularly liners, Mr Jones said.

Commenting on its future, the veteran of more than 30 years said: "It must go eventually, just how soon, I couldn't say. As satellite communication becomes cheaper and more accessible to ships, the decline will probably happen very quickly".

Retired principal of the Marconi School of Wireless (Sydney), Cec Bardwell said the hey-day of Morse was from the early 1930s, through World War 2 and the 1940s.

Cec spent 40 years involved in teaching Morse at the school, and remembers the many areas which no longer use it.

Morse communication between railway stations ended in the early 1930s, police used it to contact their patrol cars before the war and in the post war era, police intra-state and interstate communications were in Morse, Mr Bardwell recalled.

Weather reports were once gathered in Morse, and aviation communications used Morse until 1954. The Postmaster General's Department had Morse in every post office, but replaced it with teleprinters from about 1959, said Mr Bardwell.

A group of mainly former postmasters and telegraphists, called the Morsecodians, was formed in 1974 and holds annual reunions each October in Sydney. Their president, Gordon Hill said the telegram and mail were the main communication in Australia once, but that changed from the 1960s with the improvement in telephone services.

Remembering the Morse telegram days he said: "Telegraphists at the Sydney GPO handled large volumes of traffic daily and up to 400 operators, a shift, would sit by their sounders. The day Morse code went out of the post office was, in my opinion, the day the post office died."

The hobby of amateur radio was certain to be the last bastion of Morse code, although it had also seen a decline in Morse due to a number of factors. A leading Morse operator was Austine Henry VK3YL, who has been on air for 55 years, almost exclusively using the code.

"It is a part of my life, and it was only in recent years that I reluctantly used a microphone," said Mrs Henry.

Morse code will hopefully always be a part of amateur radio and those in the hobby not using it were missing out on something, she said.

"Some radio amateurs, after passing a Morse code test, give it up the minute their ticket arrives in the post. I can not understand it", said Mrs Henry.

AR

Did you know?
An amateur radio satellite, designed and built by members of the Melbourne University Astronautical Society was launched on 23rd January 1970, by NASA.

WINTERING IN THE WILDERNESS

Barry Abley VK3YXK,
61 Peter Street, Grovedale, Vic. 3216

During July and August 1985, the writer had the stimulating experience of visiting 24 National Parks, and qualified for the Keith Roget Memorial Parks Award at the same time.

The welcome advent of long service leave, and a desire to discover the natural beauty of Victoria's National Parks during this 150th year, afforded an excellent opportunity to qualify for the Keith Roget Memorial National Parks Award.

The advantage of undertaking a challenge to visit 20 National Parks during the Winter months of July and August, is an opportunity to appreciate the immense variety of flora and fauna available to the visitor, during a season of serenity. The solitude enables the observer to catch a glimpse of nervous marsupials or timid birds, like the Lyre Bird. An early morning walk can be particularly fruitful when, on occasions, you have the whole park to yourself.

Winter in Victoria offers periods of mild weather, extending from a few days, to a week. The arrival of a High Pressure Cell will result in fine days, crisp mornings and cold nights. During early August, while visiting many beautiful parks in Gippsland, skies were clear and the days perfect without flies.

The tremendous variety of scenery and animal life available is only surpassed by the diversity of conditions which face the amateur operator, determined to gain contacts on two metres FM. The proliferation of well sited repeaters makes the task of logging contacts, during a mid-week visit to a National Park, a much easier proposition, than would be the case if simplex contacts only were permitted.

You Yangs from Brisbane Ranges N P.

Thurra River, Croajingolong N P

Beach Scene from Croajingolong N P.

Wyperfeld was wet.

By using a FT480R transceiver and a five element beam, on a four metre mast, a surprising number of repeaters were able to be accessed from parks in all areas of the State. Of the 24 National Parks visited, 22 were in locations from which repeaters were accessible.

I am indebted to amateurs in more remote locations, who went out of their way to arrange scheds, which enabled me to activate parks and gain points for the Award. It would not have been possible to work from Croajingolong, Lind, Alfred and Lower Glenelg Parks without the co-operation of Alan VK3AGK, at Orbost, Lindsay VK3ANJ, at Lakes Entrance and Doug VK5AJR, at Penola, SA. A great deal of satisfaction was gained by being able to access the Warrnambool Repeater, VK3RWL, using a FT207R hand-held, from the summits of Mounts Eccles and William, during the first week of operation of the repeater in its permanent site.

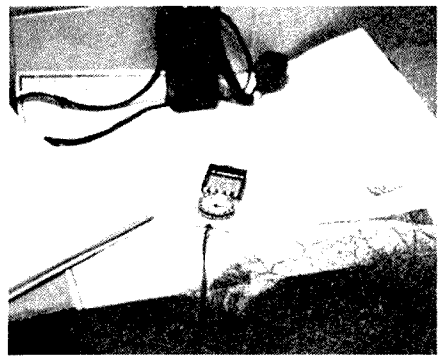
The Keith Roget Award encourages the amateur operator to enjoy the delights and uncertainties of portable operation, and at the same time, appreciate the scenic beauty of Australia's parks. This

Lake Hattah, Hattah-Kulkyne N P

REPEATERS ACCESSED FROM NATIONAL PARKS VISITED

NAME	APPROX DIST FROM MELB:km	SIZE/ha	ROAD CONDX	VK REPEATERS ACCESSED/VK
SOUTH-WEST VICTORIA				
Otway NP	200	12750	S/G	3RML,7RAA & 7RNW
Port Campbell	250	1750	S	3RBA
Mount Eccles	200	400	S	3RWZ, 3RWL, 3RBA, 5RMG
Mount Richmond	350	1707	S/G	3RWL, 5RMG
Lower Glenelg	400	27300	S/G	5RMG
Grampians	200	167000	S/G	3RBA, 3RMM, 3RCV, 3RWL, 3RWZ & 5RMG
NORTH WEST				
Wyperfeld	450	100000	S/G	Nil
Little Desert	380	35300	S/G	3RWZ
Hattah-Kulkyne	500	48000	S/G	Nil
NORTH EAST				
Fraser	150	3750	S/G	3RML, 3RBA, 3RGL & 3RCV
AROUND MELBOURNE				
Brisbane Ranges	75	7485	S/G	3RBA, 3RGL, 3RML, 3RSG & 3RMM
Organ Pipes	30	85	S	3RML, 3RBA, 3RGL & 3RMM
Kinglake	55	11290	S	3RML, 3RGL, 3RMM, 3RCV, 3RSG, 3RWG & 3RLV
Ferntree Gully	34	466	S	3RML, 3RGL & 3RWG
Churchill	40	193	S	3RML, 3RGL, 3RBA & 3RMM
SOUTH/WEST GIPPSLAND				
Wilsons Promontory	250	49000	S	3RLV, 3RSG & 3RML
Tarra Valley	200	140	G	3RML, 3RLV & 3RWG
Bulga	215	80	S	3RML, 3RLV
Morwell	170	283	S	3RML & 3RLV
EAST GIPPSLAND				
The Lakes	330	2380	S/G	3RLV
Glenaladale	300	183	S/G	3RLV & 3RWG
Croajingolong	495	86000	S/G	3REG
Lind	450	1166	S/G	3REG
Alfred	500	2300	S	3REG & 3RLV

S denotes Sealed Road . . . G denotes Gravel Road



Some of the gear used on the NP Expedition.

variety is reflected in the contrast of Victoria's National Parks, and range from the rugged coastline of Port Campbell N P, the fern lined forest gullies of Tarra Valley, Bulga and Lind N Ps, to the open Mallee plains and river red gums of Wyperfeld and Hattah-Kulkyne.

I thank the late Keith Roget for the inspiration of this award, and encourage other amateurs to combine the pleasures of our rewarding obsession with some of Australia's beautiful places.

AR

SIMPLE ADD-ON TUNING INDICATOR FOR S E Q T G DEMODULATOR

D C Hunter VK4ADC
South East Queensland Teletype Group
PO Box 184, Fortitude Valley, Qld. 4006

Since the introduction of the SEQTG TG170D demodulator PCB, in about 1980, some 300 boards have been sold throughout Australia and the Pacific. In the original design, the tuning indicator was in the form of a meter, which gave a steady indication when the receiver was correctly tuned to the incoming RTTY signal. The circuit described in this article allows the inclusion of two LEDs to make the tuning even easier.

One LED driver circuit is fed from the output of the mark channel bandpass filter in the demodulator, while another is, in turn, fed from the space channel. The audio signal from each channel is then fed to the respective peak envelope detectors and the resultant DC is used to vary the forward base bias current of the respective transistors. A LED, in series with a current limiting resistor, is then connected between the positive supply rail of the demodulator and the collector of each transistor.

No retuning of the demodulator is normally required after connection of the circuit to the final mark and space test points, however a quick tuning check is desirable. As the LED driver circuit is linear, the advantage of its level sensitivity can be utilised by reducing the mark or space audio tone level to the point where the particular channel LED is just glowing quickly.

The three bandpass trimpots can then be tuned for optimum response as indicated by the LED.

Since layout is reasonably non-critical, the construction is left to the individual, although veroboard or a PCB is recommended. Transistor types and component values can be changed to suit your spare parts supply, but within normal selection tolerances, as this design is relatively non-critical.

AR

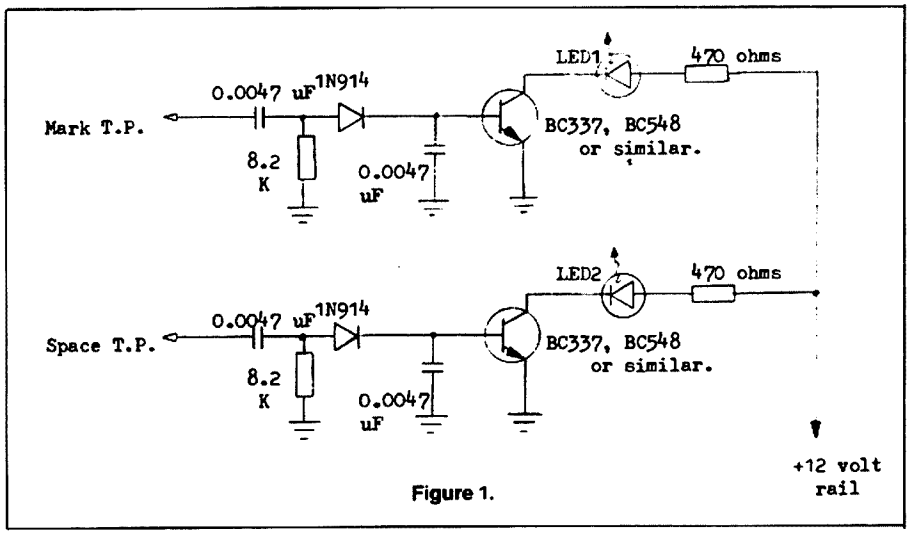


Figure 1.

International News

Larry Price W4RA.

Carl Smith W0BWJ.

David Rankin 9V1RH/VK3QV.

John Allaway G3FKM.

Al Shaio HK3DEU.

Dick Baldwin W1RU.

Michael Owen VK3KI.

David Sumner K1ZZ.

David Wardlaw VK3ADW.

Pedro Seidemann YV5BPG.

Lou van der Nadort PA0LOU.

Photographs courtesy Bett McLachlan.

IARU MEMBERS MEET IN MELBOURNE

Member societies of the IARU met in Melbourne, prior to attending the WIA's 75th Anniversary Dinner, for discussions about the forthcoming Sixth Conference of the IARU Region 3 Association in Auckland, NZ.

NEW MEMBERS

The Brunei Amateur Radio Transmitting Society (BARTS) was elected to the membership of the IARU, in July 1985. Also, the Amateur Radio Club of Tonga (ARCOT) has submitted an application for membership, so it is anticipated they will become the 24th Member of the IARU, Region III.

REUSING OLD CALLS

Amateur stations in Japan have made such a rapid and large growth that statistics published in September 1985 state the number of stations as over 600 000.

Owing to this trend, authorities were concerned that they would run out of call signs with the prefixes JA-JS, allocated by the ITU for the JA1 area, which is situated in and around Tokyo.

To cope with the shortage, the authorities have decided to assign call signs, once issued but now abandoned, to new stations. The new ruling came into effect in October 1985. It will now be that prefixes JE-JS will be used and the suffixes will be a combination of three alphabetical letters. Call signs with two letter prefixes will no longer be used.

Stations In Ogasawara and Minami-Torishima islands will retain their old prefixes.

From Region 3 News — October 1985.

LATITUDE AND LONGITUDE FROM A STREET DIRECTORY

Noel Lavelle VK3ABH

4 Wembley Court, Forest Hill, Vic. 3131

Now that the Melway's Street Directory for Greater Melbourne includes the 1km Australian Map Grid (AMG), it seemed that a simple programme could convert AMG co-ordinates to latitude and longitude with a fair degree of accuracy. AMG information appears on page 14 of the directory. The listing shown in this article is for a Sharp PC1200 (Tandy TRS-80, Model PC1), Pocket Computer. Few small computers have the number crunching capability of this particular device, which has been a most useful tool in the shack, and elsewhere, for half a decade.

The programme is so simple that little comment is necessary — the memory allocation shows what is where.

Initialisation is mainly concerned with formatting the output to suit the 16 character per line printer, or the inbuilt 24 character liquid crystal display (LCD).

Data entry and selection of the appropriate vertical and horizontal co-ordinates, and the mean convergence angle between True North and AMG from the data array follow.

The DIM statement is not available in PC1 Basic and specific addressing of the three-way "two-dimensiona" arrays is hard to read. The

```
10:REM -MAPGRID
  -
20:REM INITIALZ
  -
30:"A"CLEAR :T$
  ="S":U$="E":
  X=.00014
40:INPUT "PRINT
  ER RQD (Y;N)
  ";Q$
50:IF Q$="Y"LET
  R$="LAT. =":
  S$="LONG.="
55:REM
60:REM ENTRDATA
  -
70:"M"INPUT "NO
  RTHING? ";H
80:INPUT "EASTI
  NG? ";V
85:REM
90:REM PICKGRID
  ----VERTICAL
  -
100:IF V>357LET
  B=145.5:P=0:
  GOTO "B"
110:IF V>335LET
  B=145.25:P=1
  0:GOTO "B"
120:IF V>313LET
  B=145:P=20:
  GOTO "B"
130:IF V>291LET
  B=144.75:P=3
  0:GOTO "B"
140:IF V>269LET
  B=144.5:P=40
  :GOTO "B"
150:B=144.25:P=5
  0
180:REM
190:REM PICKGRID
  --HORIZONTAL
  -
200:"B"IF H>5833
  LET G=22.1:A
  =37.5:GOSUB
  400+P:GOTO "
  C"
210:IF H>5806LET
  G=22:A=37.75
  :GOSUB 500+P
  :GOTO "C"
220:IF H>5778LET
  G=21.95:A=38
  :GOSUB 600+P
  :GOTO "C"
230:IF H>5750LET
  G=21.87:A=38
  .25:GOSUB 70
  0+P:GOTO "C"
240:G=21.8:A=38.
  5:M=1.1:
  GOSUB 800+P
280:REM
290:REM CALCULAT
  -
300:"C"E=-.25/27
  .74:F=.25/G
310:I=C-H:J=D-V.
320:K=DMS (A+X-(
  E+(I-J*TAN M
  )):L=DMS (B+
  X-(F*(J+I*
  TAN M))
330:REM
340:REM --LIST -
  -
350:"L"PRINT
  USING ;H;V
360:PRINT USING
  "####.####";
  R$;K;T$;S$;L
  ;U$;" "
370:GOTO "M"
380:REM
390:REM GRIDDATA
  -
400:C=5848.59:D=
  367.4:M=1:
  RETURN
410:C=5848.2:D=3
  45.31:M=1:
  RETURN
420:C=5847.75:D=
  323.2:M=1.3:
  RETURN
430:C=5847.23:D=
  301.1:M=1.5:
  RETURN
440:C=5846.72:D=
  279:M=1.6:
  RETURN
450:C=5846.07:D=
  256.9:M=1.7:
  RETURN
500:C=5820.85:D=
  367.85:M=1:
  RETURN
510:C=5820.48:D=
  345.83:M=1:
  RETURN
520:C=5820.02:D=
  323.8:M=1.3:
  RETURN
530:C=5819.49:D=
  301.78:M=1.5
  :RETURN
540:C=5818.96:D=
  279.75:M=1.6
  :RETURN
550:C=5818.31:D=
  257.72:M=1.7
  :RETURN
600:C=5793.12:D=
  368.3:M=1:
  RETURN
610:C=5792.7:D=3
  46.35:M=1.1:
  RETURN
620:C=5792.28:D=
  324.4:M=1.3:
  RETURN
630:C=5791.74:D=
  302.45:M=1.5
  :RETURN
640:C=5791.2:D=2
  80.5:M=1.6:
  RETURN
650:C=5790.57:D=
  258.53:M=1.7
  :RETURN
700:C=5765.38:D=
  368.75:M=1:
  RETURN
710:C=5764.96:D=
  346.88:M=1.1
  :RETURN
720:C=5764.54:D=
  325:M=1.3:
  RETURN
730:C=5764.03:D=
  303.13:M=1.4
  :RETURN
740:C=5763.47:D=
  281.25:M=1.5
  :RETURN
750:C=5762.91:D=
  259.37:M=1.7
  :RETURN
800:C=5737.64:D=
  369.2:M=1:
  RETURN
810:C=5737.22:D=
  347.4:M=1.1:
  RETURN
820:C=5736.8:D=3
  25.6:M=1.3:
  RETURN
830:C=5736.27:D=
  303.8:M=1.4:
  RETURN
840:C=5735.73:D=
  282:M=1.5:
  RETURN
850:C=5735.24:D=
  260.2:M=1.7:
  RETURN
```

more cumbersome sub-routine method was used to provide better readability and, if desired, direct conversion to standard arrays.

If single step conversion of decimal degrees to degrees, minutes and seconds is not available on your processor, delete DMS, X and the outer brackets from both expressions at line 320 and add the appropriate instructions to perform the conversion, or leave the result as decimal degrees if it suits your purpose.

The grid data table was compiled from the current issue of 1:100,000 series Survey Maps to Australian Geodedic Datum 1966. Other maps could give numerical values for latitudes and longitudes, which differ by up to four or five seconds, or so.

The test data for nominal five minute intersections was included to enable programme checking.

		REFERENCE		AMG DATA			
LINE NO. (P) >		50	40	30	20	10	00
LONGITUDE >		144D15M	144D30M	144D45M	145D00M	145D15M	145D30M
DATA STARTS AT LINE	LATITUDE					^ 15 MINUTES ^ V = 27.74 KM. V	
		15 MINUTES		= 22.1 KM			
400	37D30M C=	5846.07	5846.72	5847.23	5847.75	5848.20	5848.59
	D=	256.90	279.00	301.10	323.20	345.31	367.40
	M=	1.7	1.6	1.5	1.3	1.0	1.0
		15 MINUTES		= 22.00 KM			
500	37D45M C=	5818.31	5818.96	5819.49	5820.02	5820.48	5820.85
	D=	257.72	279.75	301.78	323.80	345.83	367.85
	M=	1.7	1.6	1.5	1.3	1.0	1.0
		15 MINUTES		= 21.95 KM			
600	38D00M C=	5790.57	5791.20	5791.74	5792.28	5792.72	5793.12
	D=	258.53	280.50	302.45	324.40	346.35	368.30
	M=	1.7	1.6	1.5	1.3	1.1	1.0
		15 MINUTES		= 21.87 KM			
700	38D15M C=	5762.96	5763.47	5764.03	5764.54	5764.96	5765.38
	D=	259.37	281.25	303.13	325.00	346.88	368.75
	M=	1.7	1.5	1.4	1.3	1.1	1.0
		15 MINUTES		= 21.8 KM			
800	38D30M C=	5735.24	5735.73	5736.27	5736.80	5737.22	5737.64
	D=	260.20	282.00	303.80	325.60	347.40	369.20
	M=	1.7	1.5	1.4	1.3	1.1	1.0

```
   * MAPGRID *
MEMORY ALLOCATED        TEST DATA

A =REF. LATITUDE                    5856.83                  5802.23
B =REF.LONGITUDE                     315.6                    360.83
C =NORTHING REF.    LAT. =  37.2500S         LAT. =  37.5500S
D =EASTING REF.     LONG.= 144.5459E         LONG.= 145.2500E
E =N/S DEG./KM.
F =E/W DEG./KM.                     5836.38                  5780.94
G =E/W KM/15MINS                     242.46                   244.18
H =NORTHING I/P.    LAT. =  37.3500S         LAT. =  38.0459S
I =DELTA NORTHNG    LONG.= 144.0500E         LONG.= 144.0500E
J =DELTA EASTING
K =O/P LAT. D.MS                    5837.24                  5781.96
L =O/P LONG.D.MS                     271.89                   280.75
M =CONWERGENCE <    LAT. =  37.3501S         LAT. =  38.0500S
P =DATA POINTER     LONG.= 144.2500E         LONG.= 144.3000E
Q$=PRINTER FLAG
R$=PRINTER LAT-                     5800.24                  5745.69
   ITUDE LABEL.                      272.91                   310.85
S$=PRINTER LONG-    LAT. =  37.5500S         LAT. =  38.2500S
   ITUDE LABEL.     LONG.= 144.2459E         LONG.= 144.5001E
T$=LAT.DIRECTION
U$=LON.DIRECTION                    5838.66                  5783.73
V =EASTING INPUT                     330.77                   361.15
X =DEGREE VALUE     LAT. =  37.3500S         LAT. =  38.0501S
   OF 0.5 SECOND    LONG.= 145.0500E         LONG.= 145.2500E

                                    5839.21                  5746.19
DMS FORMAT:                          360.2                    332.68
INTEGER =DEGREES    LAT. =  37.3500S         LAT. =  38.2501S
1+2 DEC.=MINUTES    LONG.= 145.2500E         LONG.= 145.0501E
3+4 DEC.=SECONDS
```

For the area covered, one second of latitude is approximately equal to 30.8m, and one second of longitude varies from about 24.2 to about 24.5m.

Users of pocket computers of the types mentioned should note that it is impossible to load the programme as it is listed. Omitting all remarks will leave the basic programme to exactly fill the available programmable memory. (MEM shows 0 steps 0 memories). The remarks were appended by listing the programme in two parts. **AR**

AMATEUR RADIO CROSSES THE NULLARBOR

Graham Horlin-Smith VK5AQZ
2 Athol Avenue, Tranmere, SA. 5073

The following is a report of a historical Railway Mobile DX-Pedition on the Trans-Australian, across the Nullarbor Plain. The round trip of 5320km from Adelaide to Perth, and return, occupied rail-time of five days travelling.

A chance QSO with Graham Prince VK5BGP, an employee of Australian National, concerning the possibility of working amateur radio on the Trans-Australian, led to further negotiations taking place with a public Relations Officer of Australian National. Immediate acceptance for a planned railway trip was given. In all, the initiation and completion of the promotional journey took less than three weeks to organise.

The amateur group departed Keswick Main Terminal on 11th September, arrived Perth on 13th, and returned to Adelaide in the evening of 16th. Accommodation was a Wegner First Class Coach, provided by Australian National, who also handled media coverage in Adelaide whilst Westrail covered the Perth end of the historic journey.

AND SO TO MAKE IT WORK

The SA Division's Jubilee 150 Task Force were responsible for suitable antennas, equipment, and display material to highlight the radio activity.

On Preparation Day, Saturday, 7th September, a variety of antenna systems were assembled. The antennas consisted of a 25 metre long wire, end fed to a TS93X, for 80 and 20 metre work, a 40 metre Hustler, linked to a TS820S, was attached to the passenger entrance hand rail, and extended above the roof of the mobile coach. A 40 metre whip was fixed directly opposite the Hustler on another hand rail. A TR2500 hand-held with base power supply and a Kyokuto FM, with homebrew scanner and 60 watt amplifier maintained 2 metre communications from a quarter wave base antenna clamped to the coach roof.

The long wire configuration is worthy of comment. As all antennas were limited to a height of half a metre above the roof, to allow clearance under bridges and tunnels, the open wire was suspended at this height with 10

Rod Durbridge of the South Coast ARC, on the roof of the Wegman Coach, adjusting the long wire antenna.

spaced 13mm pieces of varnished doweling, and secured to the roof with 63mm diameter suction cups. Two 25mm pieces of water pipe, with doweling sleeved into each pipe supported the long wire at each end of the coach.

With preparations complete, the last job before departure was to 'dress-up' the mobile home internally, and externally, with promotional material to identify, "Amateur Radio, Live Across the Nullarbor", and to highlight the historical significance of the expedition. Block letters 229mm high on signs almost the length of one side of the 25m coach said it all; *"SA Amateurs — World Communications with Australian National — Across the Nullarbor" and 305mm letters detailing the call signs VI5JSA and VK5JSA.*

Due to turn arounds at Port Pirie and Kalgoorlie of the twin diesel hauler, particular attention was given to lighting up the passenger platform side of the train at ports of call. Inside the comfortable 15 berth carriage, corridor, and operating locations, colourful posters completed the story of the SA Division's involvement in the activity.

The entourage, once on the rails, resembled something not unlike a mobile amateur flying flagship coach, with an antenna clothesline locked into the huge Trans Australian Nullarbor convoy. Travelling at speeds of up to 110km per hour, it was indeed an exciting adventure for the three amateurs, plus the two Australian National employed amateurs on board.

Ready to go. (From left) Alan VK5ZN, Bob VK5BJA, Peter Koen, Graham VK5AQZ, Rowland VK5OU.

REASONS AND OBJECTIVES

The main aim was to promote Australian National by making Australian and world wide radio contacts. This was done to the tune of in excess of 500 logged contacts.

The trip also provided the group with the opportunity to make some mention of Jubilee 150 activities for South Australia in 1986, the America's Cup in Western Australia in 1987, and the Grand Prix for Adelaide in November 1985.

EXPERIMENTATION

Whilst there will be abundant, well documented evidence to suggest that many of these aims and objectives were met by the group, the trip also provided a golden opportunity to experiment with antenna systems, reaffirm amateur links between the SA and WA Divisions of the Institute, and to promote goodwill by way of radio exchanges with Australia and the world.

Because of the peculiar location of working railway communications, the choice was made

BELOW:
The Goldfields Amateur Radio Group welcomed the train at Kalgoorlie. (From left)Phil SWL 60370, Graham VK5AQZ, Alan VK5ZN, Susan, XYL of VK6ZGQ, Dianne VK6KYL, Bill VK6ZX, Bert VK6ZAJ, and Lewis VK6ZGQ. Bill is receiving a SA Jubilee 150 Flag.

BELOW:
VK6 Farewell Party. (From Left)Steve VK6IR, his XYL Sherle, Alan VK5ZN, Trevor VK6CI, his XYL Margaret, Graham VK5AQZ, Peter Koen.
(Front)John, Anthea, Marilyn Prestage, and an unknown VK6 amateur.

At Port Augusta, local residents Ron VK5AP and Peter VK5BWH visited the train. (From left) Ron, Peter, Graham VK5AQZ, Alan VK5ZN and Peter Koen.

to work strictly barefoot operations. The dangers of using a high-powered linear may have caused problems like loading the antennas, which, at the best of times, may not have been totally efficient systems.

Links were reaffirmed with the amateur populace along the way, in particular with the Goldfields ARC in Kalgoorlie. Platform cheering, waving, banner flying, generous words of welcome, and presentation exchanges made the meeting and link all the more worthwhile.

The many logged contacts were confirmed, railway mobile two-way QSOs, on the Jubilee 150 special souvenir QSL cards. Later, confirmations of the VI75A call sign, activated for about 24 hours of the return trip, will be sent. Propagation and band conditions were not brilliant, but it just meant the group had to work a little harder for the contacts.

Graham VK5AQZ, operates two metres through the Bluff Repeater, Port Pirie.

Graham VK5BGP, has his turn at the operating desk.

SUCCESSFUL JOURNEY

The attention and interest shown by passengers and visitors to the operation, the keeping of a visitors book, and the many requests for Peter Koen's special silk-screened wall poster depicting the trip, made for pleasurable engages with the people along the way. Peter also made good use of video and camera equipment to provide a record of the trip for the future. The group also added to the limited communications aboard the train, as they are

The Train Examiner, Mr Henry Cox checks the TS93X.

limited, particularly between Port Augusta and Kalgoorlie, save for emergency telephones placed strategically along the tracks.

Media coverage was exceptional, thanks to press releases by Australian National. Local radio stations, 5DN and SAFM ran news clips, as did television channels 9 and 10 in South Australia, also Channel 9 in New South Wales. The group were also interviewed for the VK6 WIA Sunday Broadcast by Douglas VK6ZMG and Sue VK6JU.

A special interview, with Bob Burns of 5DN, was made in a special amateur to amateur hookup. Bob was in the shack of Bob VK5BJA and interviewed the group as they were mobilising over the SA/WA border. Parts of the interview were played on the following two mornings breakfast show.

Overall, the trip was a resounding success.

SOME CONTACTS OF NOTE

Douglas VK6ZMG, VK6 WIA Broadcast Officer; Bob VK5BJA, with Bob Burns, DJ with 5DN, as second operator; Bill VK6AG, first QSL — hand-delivered to Perth Terminal; Ken VK2GA — first postal QSL; Don VK5ADD, SA Councillor and JOTA Co-Ordinator; Trevor VK6CI — worst RST (2x1); Peter VK5BWH, and Ron VK5AP — eyeball QSO at Port Augusta; Ron VK5RV, at Rawlinna Crossing, 1036km from Perth, waving his two metre hand-held; Jerry VK3CK - second worst RST (2x4); Chuck VK6CF — big RST; Bill VK6ZX — rail mobiler entrepreneur; Ray VK6ET and the Goldfields ARC, Kalgoorlie; Bob VK5BJA — most technical/production calls.

Alan VK5ZN makes adjustments to the 40m whip, supervised by Graham VK5AQZ.

Photographs courtesy Peter and Joanne Koen

Special thanks are extended to the following: Bob VK5BJA, Alan VK5ZN, Rob Durbridge, Peter Koen and Graham VK5AQZ for all their pre trip work. Bill VK6ZX and Dianne VK6KYL for their entrepreneur skills. Rolley Housden, Westrail Technician, who saved the antenna farm. Australian National employees Keith VK5NAX and Graham VK5BGP working on-duty amateurs, and PR work amongst the passengers. Angelo of Westrail, who stopped the train 10 minutes out of Perth so that Alan VK5NZ could periscope the resonator above the train roof to increase contact possibilities (and it worked).

The group acknowledges the support of the following: Australian National and Bob Sampson AN Promotions Officer; Westrail; Staff and employees of both railways; WIA SA Division; Rowland Bruce VK5OU — Federal Councillor; Joe Valente and Captain Flash Ensigns; John Moffatt and International Communications Services; Jubilee 150 Brochures; Department of Tourism — QSL cards; Nigel Jays of Dick Smith Electronics; Rob Durbridge and South East ARC — equipment; Bob Dodd VK5ADR — 2 metre equipment; Dick Ashton VK5DQ — antennas; John Ingham VK5KG — video films; Mark Thwaites Menswear.

The amateur group were: Alan Roocroft VK5ZN; Peter Koen Secretary VK5BPA; and Graham Horlin-Smith VK5AQZ with much assistance from Australian National amateurs Keith Pettman VK5NAX and Graham Prince VK5BGP.

AR

QSP

ELEVENTH-HOUR BID TO KEEP GREENWICH TICKING

Keepers of Greenwich Mean Time plan to let their clocks run down and stop — although eleventh hour attempts are being made to keep them going.

Royal Greenwich Observatory's six atomic clocks would be left to stop over the next two or three years because there isn't enough money for their maintenance.

The Observatory has been keeping time since its founding in 1675, although the world has, for some years, relied on time readings by the International Organisation of Legal Metrology (Weights and Measures), in Paris, which provides Co-ordinated Universal Time.

Timekeepers originally began keeping the GMT standard using a Grandfather Clock, but with atomic technology, time keeping accuracy was to one-millionth of a second.

At the heart of the clocks are expensive vacuum tubes containing the atomic element cesium, which have to be replaced every few years.

The problem is that it costs between $100 000 to $200 000 (Australian) a year to keep the six aging clocks operating.

NEW TIME DELAY

SBS-TV has unveiled an advanced new programme time delay system which will allow the network to transmit material to four different local time zones across Australia — the first system of its kind in the world.

From 27th October, the SBS-TV system has allowed the network to direct programmes from its Sydney studios to South Australia and Queensland, in their respective local times.

The operation of the new delay system coincided with the onset of Daylight Saving. From 27th October, South Australia is still 30 minutes behind Eastern Standard Time, while Queensland's non-adjustment to DST has placed them one hour behind.

The system will also come into operation in Perth, when SBS-TV begins operation there early this year. Perth is three hours behind DST.

The system, manufactured by the Sony Corporation of Japan, is a result of extensive research to develop an efficient method of transmitting networked television programmes across Australia.

The time delay equipment is divided into three areas. The heart of the system is in the network's Milsons Point studios, Sydney. The two other systems are located in Melbourne and Perth, delaying programmes to South Australia and Western Australia, respectively, and consists of 23 video tape machines, and six unique delay system controllers. This new system will allow SBS-TV to feed its material to all markets at the same local time, ie 'World News' at 7.00pm in all areas.

By automatically holding programmes for the necessary period, viewers in the different interstate time zones will be unaware that the material they are viewing is being delayed in any form.

AUSTRALIAN RADIO JOURNALS BEFORE 1939 — A SURVEY

Chris Long,
6 Torring Road, East Hawthorn, Vic. 3123

*Continued from December. . .

A really extraordinary Melbourne journal published at the end of the 1920s was RADIOVISION, published by Television and Radio Laboratories and edited by Donald Macdonald. It ran monthly from September 1928 to October 1929. Macdonald kept his readers up-to-date on the latest developments in Baird-type mechanical television and facsimile, corresponding constantly with such American pioneers as C

11th July 1928.

Francis Jenkins and Dr E F W Alexanderson. His chief engineer was Gil Miles VK3II 'later VK2KI', who built the first working television system in Australia for the company. After some months of test television transmissions through 3UZ, the experiments were terminated, and the magazine seems to have folded at about the same time A bound set of this journal is held by the State Library, and a few duplicate issues are held by the Museum of Victoria.

At least one Australian radio firm ran a staff magazine during the 1920s. AWA in Sydney published THE RADIOGRAM from about 1928. It was a scaled-down equivalent of the American BELL LABORATORIES RECORD, containing social and general technical information on their corporate activities. Today, with much of AWA's early official records lost or discarded, it is an important guide to the experimental work of a major local manufacturer.

A journal, which I know only from lists of magazines for sale from Homecrafts, is the AUSTRALASIAN WIRELESS REVIEW, published about 1925. Does anybody know what this journal contained? I assume that it was Sydney-based, as no copies are held in the State Library of Victoria.

From about the start of 1930, Ossie Mingay in Sydney, published the RADIO AND ELECTRICAL MERCHANT, later the RADIO RETAILER OF AUSTRALIA, as a professional weekly trade paper. While not relating directly to amateur radio activities, it contains much detail of the personal and professional lives of many prominent amateur operators. It also contains a host of facts and figures pertaining to communications, broadcasting and electronic hardware. Mingay's publishing company, Australian Radio Publications Limited of Sydney became very active in promoting local trade journals and annuals. From the historian's point of view, the most important of these is the RADIO TRADE ANNUAL OF AUSTRALIA, published yearly from 1933 until at least 1942. This is an indispensable compendium of radio facts and figures, including such key items as Annual Reports of the ABC, popular receiver circuit designs, directories of radio importers and manufacturers throughout Australia, and a 'who's who' of radio trade and engineering figures. It was sometimes known as the RADIOTRON TRADE ANNUAL. From 1935, they also published the BROADCASTING BUSINESS YEAR BOOK, providing an inside view of facts and figures on Australian B class (commercial) radio broadcasting.

Radio journals proliferated around Australia during the 1930s, and many of them were listed regularly in the RADIO TRADE ANNUAL OF AUSTRALIA:

"AUSTRALASIAN RADIO WORLD (Sydney), published monthly from May 1936 until about 1951. A technical journal in similar vein to the present ELECTRONICS AUSTRALIA, including frequent articles on aspects of amateur radio

"SHORT WAVE RADIO NEWS (Sydney), a specialist enthusiast's magazine, of which only a few monthly copies from 1936 are held in the State Library of Victoria.

"RADIO REVIEW (Sydney, early 1931), later TELEVISION AND RADIO REVIEW (from October 1931), later again the RADIO REVIEW OF AUSTRALIA. A monthly technical journal incorporating the early proceedings of the Australian IRE.

"AUSTRALIAN RADIO NEWS (Sydney, from c1933), weekly programme and technical journal published by the BULLETIN.

"ERDA, monthly official organ of the Electrical and Radio Association of New South Wales, from c1933.

"QUEENSLAND RADIO NEWS, a Brisbane monthly technical and programme magazine, established in February 1925 and running well into the 30s.

"RADIO MONTHLY, a Sydney publication for amateurs and radio experimenters, running from 1931 to at least 1935.

"THE BROADCASTER, a Perth weekly programme and technical paper circulated in Western Australia. Active by 1934, possibly earlier.

WEST AUSTRALIAN WIRELESS NEWS AND MUSICAL WORLD, a Perth fortnightly programme and journal, active c1934.

BROADCASTING BUSINESS, a national weekly trade paper based in Sydney, covering the activities of commercial B class stations, from c1934.

"RADIO PROGRAM, later RADIO-PROGRAM PICTORIAL, a non-technical weekly radio entertainment magazine, published in Melbourne from 1934, containing programmes, programme notes and articles.

"TELERADIO, a weekly Brisbane magazine with technical and programme material, on sale right through the 30s, possibly earlier.

"LISTENER'S WEEKLY AND SCREEN NEWS, an Adelaide weekly programme guide, non-technical with articles on radio entertainment, illustrated. Published from c1935.

"RADIO PICTORIAL OF AUSTRALIA, Sydney weekly popular magazine for listeners, published from c1935.

"TEMPO AND TELEVISION, Sydney music, radio, gramophone and entertainment magazine, first published 1937.

"RADIO CALL, Adelaide weekly equivalent of the LISTENER-IN, semi-technical but mainly radio entertainment and programmes, published from c1933 onwards.

To place this in perspective, these journals survived in the face of competition from over 100 British and American radio journals like WIRELESS WORLD and RADIO NEWS. This is a true indication of extreme public interest.

Some of the more professional radio magazines, not intended for public sale, should also be mentioned for the sake of completeness. Various branches and associations within the PMG's Department published journals during the 1930s. Among the expected papers on telephone technology, the occasional radio article pops up. Some of the best papers were published by the members of the PMG Research Laboratories, which were at 59 Little Collins Street, Melbourne, in those days. All technical equipment for the Australian Broadcasting Commission had to be tested by them prior to installation, and their tests were published in many cases. Some of them appeared in the TELECOMMUNICATION JOURNAL OF AUSTRALIA, a rather formal journal established in 1935 with covers of blue cartridge paper, not unlike a thin version of the early Bell Systems Technical Journal, which

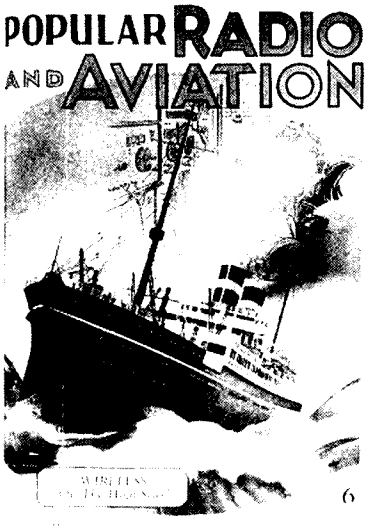
perhaps they were emulating. More papers of this type were published in the obscure AUSTRALIAN POSTAL ELECTRICIAN, which is held by very few libraries. I have only seen copies held by old PMG employees.

Papers of a more purely scientific type were published in the AWA TECHNICAL REVIEW (commenced 1936), or as papers from the Radio Research Branch of the CSIR, later the CSIRO.

Irregular pamphlets are probably a borderline case for inclusion in this article, but it's worth noting that in the late 20s the Australian Broadcasting Company published many of Howard Kingsley Love's regular radio talks in this form. They cover many aspects of radio and amateur radio in general terms. Some of these have been preserved in the engineering pamphlet collection of the State Library.

Another particularly interesting and voluminous early document on radio is the transcript of the first ROYAL COMMISSION INTO WIRELESS BROADCASTING 1926-27. Evidence was accepted from hundreds of radio operators, listeners, radio clubs, engineers, programme makers and others in all states. The verbatim transcripts run to 13 volumes of typescript! These are held by the Australian Archives' Mitchell office in Canberra, along with wireless journals, correspondence books, note books of the commissioners, draft reports and so forth. It is an amazing survival, held at reference number CP657. A lot of other material related to Commonwealth radio services is held there.

Lastly we come to the Institution of Radio Engineers, whose early local proceedings were published in the RADIO REVIEW OF AUSTRALIA. In 1938 the IRE organised a World



1st March 1929.

Radio Convention in Sydney, on an unprecedented scale, to coincide with Australia's 150th birthday celebrations. They published the PROCEEDINGS OF THE WORLD RADIO CONVENTION as an excellent book, containing a host of fascinating technical papers presented by the world's foremost engineering talent. John Logie Baird personally reviewed his early work in TELEVISION — A GENERAL SURVEY, while Dr J D McGee represented his main competitors and read a paper on the Marconi-EMI television system. The story of BROADCASTING IN AUSTRALIA was presented by the Director-General of the PMG, Mr H P Brown, with a useful chronological list of Australian broadcasters appended to his paper. L. A Hooke, the General Manager of AWA talked about 'Australian Radio Communication Services'. This covered AWA's involvement with short wave beam wireless, coastal radio and aeronautical radio.

Soon after the 1938 World Radio Convention, the Australian Branch of the IRE began to publish its own monthly journal, bringing the first phase of radio publishing in Australia to a suitably respectable close. The PROCEEDINGS OF THE AUSTRALIAN IRE probably represent the acme of radio publication at the start of the Second World War.

This article was written as a rough attempt to assemble a literature survey of early Australian radio, particularly amateur radio. My research is necessarily limited on journals published for the local market in distant states such as Western Australia and Queensland. Far more research is necessary before a formal bibliography can be published. This is a necessary first step in the progress to a detailed history of the WIA. Only a small percentage of these journals are listed in the Australian Bibliographic Network's SCIENTIFIC SERIALS IN AUSTRALIAN LIBRARIES (SSAL).

Do you have any old Australian radio magazines stored away? Can you add any details to our list?

Perhaps you might like to drop me a line at the above address. A follow-up article will be written, as a result of your response, which I hope will add to the cause of accuracy and scholarship in Australian radio history.

KEY TO LOCATING SOME OF THE RADIO JOURNALS MENTIONED IN THIS TEXT, AT THE STATE LIBRARY (V)

RADIO EXPERIMENTER AND RADIO EXPERIMENTER — BROADCASTER are all bound together in one volume, Dec (23 - July) 25.
Call number: sf 621.384
R 11 E

EXPERIMENTAL RADIO — BROADCAST NEWS AND RADIO BROADCAST (Aust). Some are bound, others are tied together in a bundle with cloth tape.
Call number: sf 621.384
R 11 B

Make sure to ask for Australian (Radio Broadcast), as an American publication of the same name is shelved beside it.

RADIO full name: (Radio In Australia and New Zealand). Most issues, except for the last, are bound, from 4th April '23 to 13th April '27. Unbound vols to 15th Dec '28.
Call number: s 621.384
R 11 I

THE HOME CRAFTSMAN, bound in a single volume, 15th Sept '23 to 16th June '24.
Call number: sf 680.5
H 75 C

HOMECRAFT MAGAZINE, two bound bolumes. Vol 1' June '25 to May '26. Vol 2' June '26 to Oct '26.
Call number: s 680.5
H 75 M

POPULAR HOBBIES, series of bound volumes, Nov 1926 — early 1932.
Call number: sf 680.5
P 81

POPULAR RADIO WEEKLY — small early weekly tabloid issues from 25th Feb '25 to 13th June '28, held with standard size radio books.
I number: s 621.384
I R

AUSTRALIAN POPULAR RADIO MONTHLY AND POPULAR RADIO AND AVIATION. All bound in single volume under the latter title in folio store.
Call number: sf 621.384
P 81 R

AUSTRALASIAN RADIO WORLD is held in a series of bound volumes in folio store with blue cloth spines.
Call number: sf 621.384
Au 78 R

LISTENER-IN, WIRELESS WEEKLY, RADIO — HOBBIES AND RADIO RETAILER are all held in 621 folio store, and should not be difficult to find.

All of these books are in closed stacks, and are not available for loan for obvious reasons. They may be studied in the reading room on presentation of a call slip with details of the required journal. An attendant will get the material out of the stacks for you. There is no charge for this service. Items of interest may be photocopied, at 10 cents per page, provided that the bindings are in good condition, which in most cases they are.

AR

FINED FOR RADIO INFRINGEMENTS

Many amateurs will be aware of the Departments of Communication's efforts to curb interference on the airwaves. Following is an account, released by Graeme Barrow, Director of Public Relations, of a recent Court Action in Adelaide, which indicates the penalties that can be imposed as a result of illegal use of radio equipment, or license breaches.

A South Australian man, who made the Adelaide CB radio repeater useless for operation by hundreds of other licensees, was fined the maximum of $40 in the Magistrate's Court, and had a $300 transceiver forfeited to the Department of Communications.

Before the Court was Michael Ptasznyk, of Mile End. He was prosecuted under Regulation 12(1) of the Wireless Telegraphy Regulations for breach of the conditions of his CB radio station licence.

Evidence was given that on 29th March 1985, Departmental Officers traced Ptasznyk to a site at Mount Gawler where he was found to be making what the Department considered to be unnecessary and unauthorised transmissions on the Adelaide CB radio repeater.

Ptasznyk was continuously pressing his transmit button, and holding the microphone to the speaker of a cassette tape recorder, resulting in the continuous broadcast of music, etc.

It was stated that the Department had received numerous complaints of such disruptions over the period leading up to his apprehension.

In addition to the penalties listed above, Ptasznyk was ordered to pay $17 court costs, and $150 towards the cost of the Department's investigation.

AR

QSP

NEW TELEPHONE NUMBERS

Every telephone in France had its telephone number changed at the same time, recently. The move saw the conclusion of the use of Area Codes — all 24 million telephones now have eight-digit numbers.

About 22 000 technicians were used for the flick-of-a-switch conversion, which doubled the possible digit-combinations available for phone numbers.

The number system had become saturated, leading to inefficiency and delays in phone connections.

FIVE YEAR INDEX —— ——OF TECHNICAL ARTICLES

Last published on page 30, February 1981 AR

Please Note — Many authors call signs may have changed since these articles were published.

ASIA TELECOM '85 AND 9V1ITU

David Rankin VK3QV/9V1RN
Box 14, Pasir Panjang, Singapore. 9111.

Ever since man began travelling away from his native habitat, Singapore, the 'Lion City', became known as the crossroads of South East Asia. It has had that reputation for centuries, and today, with its ultra modern infrastructure of port and airline terminals, and telecommunication facilities, Singapore still maintains that reputation.

Therefore, perhaps it was only natural that the ITU chose Singapore as the venue for its first telecommunications forum and exhibition, to be held outside its home base of Geneva.

The period 14 to 18th May 1985, saw the co-operation between the ITU and the Telecommunications Authority of Singapore — TELECOMS — that produced 'Asia Telecom '85'.

Amateur radio was represented with a small exhibition station manned by members of IARU, IARU Region III, and the Singapore Amateur Radio Transmitting Society. As the station was set up to demonstrate modern amateur techniques to the senior officers of the ITU, and visiting delegates, it was decided to use only the AMTOR mode on the 14MHz band. Singapore Telecoms also agreed to the station using the special call sign, 9V1ITU.

The station was activated during exhibition hours only, 10am to 6pm. and because of this and poor propagation conditions on 20 metres, contacts were mainly with other AMTOR stations in Australia, Indonesia, and Japan.

Equipment used was an IC751 transceiver, loaned by the local agents, an Apricot terminal supplied by Dan Nelson 9V1SS, and a beam loaned by Kim 9V1RP which was positioned about 60m above ground, on the roof of the hotel.

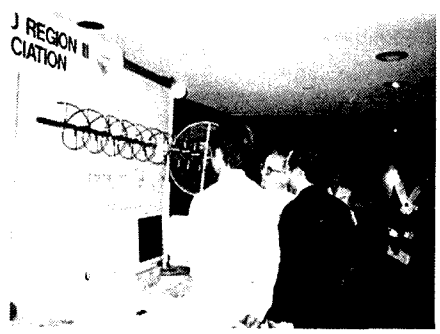
Static displays on the IARU stand included a full scale model of the JARL satellite JAS-1, kindly supplied by Shozo Hara JA1AN, of JARL. There was also a working sample of the 430MHz 'Chopstick' helical antenna designed by Colin Richards 9M2CR, and built by Jaya 9V1VS, which provided a graphic demonstration of alternate technology to interested visitors.

During the exhibition, IARU, IARU Region III and SARTS hosted a small reception for visiting dignitaries, which carried on the tradition established by the IARU at previous ITU forums and conferences in Geneva. A PAL colour tape of 'Amateur Radio's Newest Frontier' was played as a background to the proceedings.

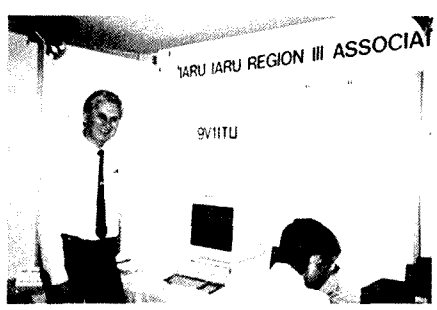
VIPs visiting included Mr Richard Butler and Mr Jipguep, Secretary-General and Deputy-Secretary General respectively of the ITU, Mr Goh Seng Kim General Manager of Telecoms Singapore, and Mr Encik Daud of Jabatam Talikom, Malaysia.

Whilst the use of a venue for an ITU forum outside Geneva was a first for the ITU, it was also a first for the IARU.

AR



David 9V1RH explaining alternative technology to senior officials from Singapore Telecoms.



Klaus 9V1WG and Kim 9V1RP at 9V1ITU.

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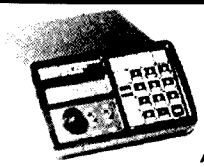

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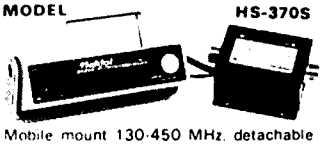

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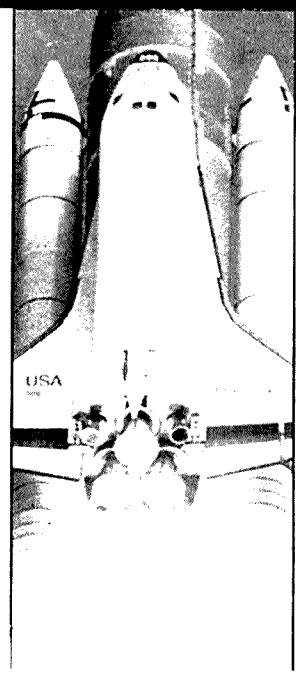
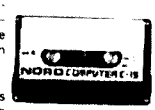


RTTY/SITOR & FAX FOR TRS-80C



DCM is a receive only program for the TRS-80C on CW-BAUDOT-SITOR.

RBA provides transceive on RTTY (BAUDOT) - ASCII.

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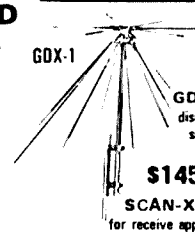

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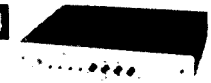
MFJ-1224



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50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Japan*
51.020	ZL1UHF	*Mount Climie*
52.033	P29BPL	*Loloata Island*
52.100	ZK2SIX	*Niua*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.325	VK2RHV	*Newcastle*
52.370	VK7RST	*Hobart*
52.400	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.470	VK7RNT	*Launceston*
52.490	ZL3SIX	*Blenheim*
52.510	ZL2MHF	*Upper Hutt*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.465	VK6RTW	*Albany*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.480	VK8VF	*Darwin*
144.800	VK5VF	*Mount Lofty*
145.000	VK6RPH	*Perth*
147.400	VK2RCW	*Sydney*[2]
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*[4]
432.420	VK2RSY	*Sydney*
432.425	VK3RMB	*Ballarat*
432.440	VK4RBB	*Brisbane*
1296.171	VK6RBS	*Busselton*
1296.410	VK1RBC	*Canberra*[4]
1296.420	VK2RSY	*Sydney*[3]
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1 A note from JH2VHL gives the frequency of the JA2IGY beacon as 50.010MHz, so the list has been amended from the original 50.008. JH2VHL confirmed a six metre contact I had with him on 23rd December 1979, and says he keeps a watch on 50.110 and 52,050MHz, and is always looking for six metre contacts.

2 As these notes were prepared in early November, it seems very likely, by the time they are read, that VK2RCW will have made its frequency change to 144.950MHz, (refer these notes December AR, and the article in September AR, page 34, as the proposed 80 metre outlet was given approval for six months from July 1985).

3 I was advised of this beacon by the VK2 boys during the 75th Anniversary Dinner in Melbourne, during November.

4 See Forward Bias column, this issue.

BRISBANE ACTIVITIES

A nice letter to hand from Angus Garland VK4AGQ, (his XYL is VK4QW), says that on 1981 there were about five regulars on the lower end of two metres, now there are about 20, some of whom are mobiles, and often just getting started. One of the longest out-of-town regulars in Bill VK4ZWH, who is at Bundaberg, some 330km distant, and can be worked in Brisbane 24 hours a day, 365 days a year, provided some effort is made. It is unfortunate that splatter from Channel 5A between Brisbane and Bundaberg forces him to operate on 144.100.2, but this must be a hindrance to others when the band opens to other places.

A few stations line-up regularly on Saturdays and Sundays at 2100 for scheds with Gordon VK2ZAB, on 144.300. Angus says it is rare now, not to exchange signal reports during aircraft enhancement. VK4s GC, AUR, BAT, KJL, YJH, AGQ, and VK2FZ/4 have all worked Gordon In recent months. Angus is hoping to also work him on 432.300MHz soon as Gordon has lifted his power to 400 watts, now.

Paul VK4AUR, has just arranged regular scheds with Ted VK4JTW and Joe VK4AEW, in Rockhampton, on 144.200 or 144.250, from 2030 to 2100, Saturdays and Sundays, with liaison on 3.615MHz. Distance is around 600-650km. Carriers/CW have been heard on each of the three weekends tried, so far; reports of 5x1 were exchanged only once on 5/10.

Angus VK4AGQ uses a TS711A — MML 200S — 3.1 wavelength 16 element F9 FT Tonna at 60 feet (18.3m), fed with half inch (13mm) heliax on two metres. FT780R, THP HL 120U, 48/70 J beams at 47 feet (14m), also fed with half inch heliax for 70cm; on six metres an FT690R, plus linear to 40 watts on a very low profile basis! From WSW to WNW, he beams into the side of a hill 150 yards (136m) away, which is bad news, but has a 'fair' look on other directions.

TWO METRE WORKING FREQUENCY

Further to the letter from Angus VK4AGQ — contained therein is a copy of a letter sent to the WIA VK4 Division, and to me for comment. I reproduce the relevant points herewith for the consideration of the multitudes.

Headed "2 METRE BAND SSB" Angus goes on to say: *"The two metre calling frequency is 144.100MHz. There is concern interstate too about conducting QSOs on this frequency, and the VHF column monthly in AR makes reference to the problems constantly.*

"Due to the low level of activity in Brisbane in the past, it became justifiable practice for stations to call and QSO on 144.100 in the hope that, with good operating procedures, DX stations might hear and call during deliberate breaks left for the purpose, calling QRZ. However, with the wider distribution of SSB gear now, the subscriber feels that a local 'natter' frequency should be established, say 144.125MHz.

"If this frequency was so used, and if sufficient publicity were given to the proposal, DX stations wishing to contact Brisbane stations, could try both 144.100 and 144.125MHz. This would avoid clutter of the call frequency, as is happening occasionally lately, with stations mobile (and otherwise), not equipped to hear weak DX. In view of the normal limits of two metre DX, the proposal could possibly be adopted in every place, in every State, where there is an interested SSB group. Most commonly these groups get together early morning and early evening. If all proceeded as proposed, it should produce two frequencies to monitor: 144.100 should be largely clear, except for CQs. The 'natter' frequency pf 144.125 may contain more extended transmissions worth listening for if conditions seem to be right in some particular direction. Observation of good operating procedures should permit a break-in on 144.125MHz.

"With the VHF DX season fast approaching (letter written in October), I seek support of the WIA Queensland Division for this proposal in VK4. If such support is forthcoming, I request that recommendation be made as soon as possible on the WIA News Broadcasts for Queensland stations contacting other stations on the SSB calling frequency to QSY to 144.125 if a QSO is intended. A brief description of the possible benefits would be desirable. The matter has been discussed with a number of local stations and none have expressed objection.

"It is not proposed that the suggested frequency become part of some official band plan, common acceptance is all that is required."

Thank you for writing Angus, and your proposal is given some publicity here. I would be pleased to hear from anyone on the matter. In the short time I have had to consider the suggestion, I cannot see anything wrong with the idea. In the past, there have been moves to have people shift up 10kHz, or down If you chose, but this has not always been successful because plenty of stations can still cause QRM to a weak signal on 144.100 from 144.110, particularly in the capital cities. Not everyone has clean a transmitter, and not everyone has a receiver which will handle cross-modulation, or sheer overload of the front end. At 25kHz separation there is more chance of successful operating by the parties concerned. It also does not need too many turns of the dial, which seems to be a problem in some shacks! My only concern could be that the 25kHz spacing could be carried over Into the FM area, where it Is known that 25kHz is still close enough to cause some repeaters to trigger with unintelligible, or no information, when line-of-sight signals to a repeater may be 70dB, or more down, but still strong enough to fire up the repeater.

Anyway, what about trying the idea during 1986 and see what happens? For those in the shack and monitoring, and with so many transceivers around with scanning facilities, it would not be a problem to cover both frequencies on a regular basis. The use of 144.125 would indicate to the listener that the station calling was available for a contact, whereas on 144.100, at the moment, when one hears a station calling CQ DX and not getting an answer, you wonder whether you should inquire if he wants a contact or leave him alone to call again later. **Your thoughts please!**

TASMANIA

Good to receive a note from an old friend of mine, Col VK7LZ, a VHF operator of many years standing. He said he had to change QTH two years ago at the Tasmanian Government's 'request' to make way for a new north/south, four lane highway. Not being a young man, the move was rather traumatic, and he has found it difficult to erect suitable antennas for the VHF bands, but does hope to get back on six metres this year. He has had to content himself with a couple of small antennas for satellite usage.

All your VHF friends will be looking for you this Es season Col, and I hope you are able to renew some of your old friendships. Like you say, it is hard to get VHF out of your system, whatever happens!

While still in Tasmania, a message from Joe VK7JG indicates he too is still well into VHF operation, and is able to keep regular nightly contacts on two metres with David VK3AUU. He has also been trying to make the distance to Sydney on the Saturday and Sunday morning scheds. Joe says it will only be a matter of time before this is achieved.

SCATTER CONTACTS

As a result of some telephoning and word-of-mouth messages, an exercise was set up in four States for Monday morning, the 28th October, to try and contact one another via what was initially thought to be a possible meteor enhancement period, but which in fact turned out to be normal conditions.

Doug VK3UM, was the master of ceremonies, and the following stations were set up for the exercise: *144.200 — VK7JG and VK3CAD to contact VK2ZAB and VK1BG; 144.250 — VK5LP and VK3AUU to contact VK4LC and VK4YJH; 144.300 — VK3NM and VK5ZDR to contact VK4KJL and VK4AGQ; 144.350 — VK3UM to contact VK2AKU and VK4GC.* Subsequently, VK5DK and VK4ZML joined in the operation.

The first named stations were to call during the first 10 seconds of the minute and listen during the next ten seconds, when the other stations would be calling. Synchronised time was to be used, and commencing at 1800UTC (4.30am in South

Australia), and to continue for an hour, frequencies to be set accurately and preferably the equipment left on all night to finally stabilise.

As a result of all this setting up, contacts did actually result, despite no enhancement of conditions. VK7JG contacted VK1BG with eight pings giving signals to 5x9; at 1852 contact was made the other way round; VK2ZAB heard VK7JG; VK3AUU was heard by VK4YJH, but not worked; at 1808 VK4AGQ exchanged 599 reports with VK3NM; VK3UM contacted VK4GC. However, there were no contacts or hearings from the VK5 end, and it was agreed later it may have been too early for our more western position. Lionel VK3NM reported hearing Channel 0 strongly for up to half a minute, but was inaudible at the time he worked VK4AGQ.

It appears not to have been a waste of time, judging by the contacts which were obtained, even if VK5 did miss out. After the exercise, reports were exchanged on 3.690MHz, so all knew soon afterwards what had occurred. Suggestions are that the exercise could be repeated between 10-14th December, when there could be enhancement from a meteor shower. The prime requirements for involvement as far as Doug is concerned are — reasonably well-set-up stations are required, capable of stable operation on an accurately set frequency, the ability to keep to a set transmitting and receiving schedule, and reliability. That is to say, if you say you are going to participate then you will be there and not have the other end calling, with no hope of a contact.

On behalf of the group I would like to thank Doug VK3UM for all his work in setting up the schedule, and I hope it will lead to bigger and better results. Just as a matter of interest, Doug did say he observed 10 minor pings, one medium ping, and one good ping occurring around 1810, 1814, and 1858, but mostly after 1830.

TWO METRES TO INDONESIA

From 'The West Australian VHF Group Bulletin' for October, comes the news that Brian VK6AIH, at Port Hedland on the NW coast, reported he had a long QSO with YD9GLJ from 0955 to 1026, on 2nd October 1985. A lot of local chatter was heard on 144.970MHz, and Brian caused a frantic search for an English-speaking operator when he called. The distance is about the same as Melbourne to Brisbane.

This path has been open in previous years, but this is the earliest known opening and promises an interesting period ahead. It certainly only takes one contact like this to keep operators at both ends more vigilant on the bands. Good work.

SIX METRES

This band has been remarkably quiet for a long time, but it did crackle into life for a while during the early evening (SA time) on 4th November, when the band opened to VK6. This info came in a phone message from Bob VK5ZRO, but I was out at the time. Oh well!

Those of us who have been on the VHF bands for a long time tend to think everyone knows about propagation, but I was reminded this was no so recently when a newcomer, over a cup of coffee, asked for some explanations, particularly in regard to sporadic E, or Es as we call it, on the six metre band. Perhaps there are others who could accept a brief comment about what causes some of the long distance contacts we have from time to time. Please bear with me Roger VK2ZTB!

Those who were active on six metres from about 1979 to 1983 would have noted how exotic stations could be worked from places many thousands of kilometres distant. In fact, approaching half-way around the world at times, particularly in the Northern Hemisphere. This was not Es, but F2 propagation, the F2 layer, which is ionisation formed by ultraviolet radiation from the sun, the amount varying according to what part of the solar cycle we are in at any time. When there are fewer sunspots, as at the moment, the radiation is lower than in years of high solar activity. We are currently in a very low spot, so we don't expect much F2 for the next three or four years, at least. Later, when the F2 layer becomes more ionised, it will reflect back frequencies much higher than it will now, the fall-off starts at around 15 metres, and worsens as we go higher in frequency. The last Cycle 21, which we recently passed through, was quite a good one, whether the next will be as good, better or worse is rather hard to determine in advance. But, peaks of sunspot activity usually occur somewhere around a period of eleven years, give or take a little. F2 propagation usually produces single hop contacts at about 4 000km and multi-hop, which can be multiples of that distance stretching around the world.

Sporadic E, or Es, commonly produces contacts up to 2 000km, which are single hop, but it is possible to have Es contacts, depending on the density of the E layer at distances much closer, even 600 or so km. The difference in distances between the hops of F2 and Es is due to the height of the layers above the earth. F2 can be 300km, and Es about 100km. Multi-hop can occur with Es too, eg VK5 to ZL is about two average hops, and instances have been recorded of distances greater than this.

Es, or the sporadic nature of the E layer, is not completely understood yet, and it is still very difficult to predict accurately when Es contacts will take place. What is known is that Es propagation is more common in the summer months, mostly November, December, and January, and again for a lesser period during June and July. There are many recorded instances of contacts via Es being made at any time of the year, right out of the "blue" the band on six metres will open for a few seconds, maybe a minute or two, half-an-hour, or for several hours, so sporadic is it that we cannot tell how long the band will be open for. It would be best said that at times of making Es contacts, other than during the summer, you should keep your overs short, because the band can fade out in a second or so, and consequently, that's the end of your contact! In the summer period, it is not uncommon for six metres to stay open to somewhere all day, and well into the night, often the area being worked follows the passage of the sun.

There seems evidence now to suggest there are several types of Es propagation, with one known as mid-latitude Es, which appears capable of forming, as a result of thunderstorms, and generally rough weather patterns, eg cyclonic disturbances, etc. The higher the storm, the more likelihood of propagation it seems. The Es pattern, or propagation, appears to be fairly independent of solar activity. In fact, the Es turn up every year whatever period of an eleven year cycle we seem to be in; but there is some evidence to suggest Es does produce openings of extreme intensity, and for very long periods at any one time, during the low part of the cycle. Because of its sporadic nature, one has to be careful not to be too definite in making such statements, and those who don't agree with such statements also need to be careful, because there is not a lot of proof either way, but it is being worked upon!

All of the foregoing may be a bit vague for some, but suffice to say to the new operator on six metres, Es can appear at any time, it can last for a short period, or for hours at a time. The directions from which you can work stations will change throughout a day of activity. It may swing from VK4 to VK6, then VK7 and perhaps back to VK4, etc. As a general rule, keep overs reasonably short, and be prepared for signals to dropout quickly. Around 1 700 to 2 000km is considered about optimum for most conditions, but 200 to 300km either way doesn't seem to affect signals much at times. Except when the level of ionisation is increasing or decreasing, the signals can be very strong indeed, one watt can be S9 + at 2 000km.

From time-to-time, you will notice that it becomes possible to work stations quite close, say 600km, or just over the State border, etc. This is known as "short-skip" and stations are generally very strong indeed, and indicates a very high level of ionisation, allowing the maximum usable frequency (MUF) to rise, often over 100MHz, and occasionally into the 144MHz band. Experienced operators are always on the lookout for "short-skip" with strong signals, and invariably they have a look at the two metre band, where contacts can be made via Es, mostly for shorter periods than on six metres, but again with very strong signals and with distances to 2 000km, or more. And on two metres, you don't fool around wasting time with unnecessary chatter, you hop in and exchange signal reports very smartly because the band may only be open for a few minutes.

Finally, one other phenomenon you will find is a warbling type of signal, generally weak, but mostly intelligible with careful listening. This is known as "back-scatter" and is a case where you may be working from, say VK5 to VK6, and you hear this strange sounding signal from VK4. Because it is weak, you turn the beam around and the signal disappears, the only way you can hear it is on VK6. Strange? Yes! But it seems the VK4 signal is being reflected around the E layer quite a bit, before coming down and it would seem to be reaching you by reflection from the layer, which is probably ahead of you on the VK6 path.

That is a brief outline of what happens. It will not satisfy a lot of people, but I have tried to keep the language plain, and hopefully understood. Es provide a great deal of enjoyment for VHF operators, and if it were absent I am sure band interest would suffer. Suffice to say, it is possible, on a good Es day, to work all Australian States, all New Zealand call areas, and a few Pacific countries as well. Such days are not common, but most years do produce some periods when such contacts are possible. The rest of the time we need to be content with contacts to, say two or three States, or maybe only one, but the unknown nature of what is going to happen next keeps our interest.

Closing with the thought for the month: *"Notice how no one talks about two living as cheaply as one any more. That's because it is barely possible for one to live as cheaply as two."* All the best for 1986. 73. The Voice in the Hills.

AR

The Astrologer Galileo, first sighted Jupiter's Satellites through his makeshift telescope on 7th January 1610.

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

It has been customary for this column to feature a well known DXer, as a guest writer, at the commencement of each year. It has taken a lot of endeavour to persuade one of our country's identities to express her thoughts on the hobby, as she has seen it through the period of in excess of half a century, due to her nature of not wanting tc discuss her achievements.

The person is no other than Austine VK3YL. Austine was licenced on the 13th May 1930 and her introduction to the hobby came after a sojourn in hospital for a tonsillectomy.

My first question to Australia's longest living active licenced YL, was how did you become interested in the hobby? The answer was *"I don't know where my interest really came from, but after a tonsil operation and whilst recuperating, my Uncle Rob asked me what I would like? The prompt answer was, a wireless set. Duly the wireless set arrived complete with two poles for the antennal I was enthralled and soon began building crystal sets, later expanding my techniques to building DC receivers, but the little crystal sets were just great. I have very vivid and fond memories of staying up late to listen to Queen Wilhelmina of Holland, in a broadcast and other great events of those days.*

"Using a valve receiver, I tuned into the amateur broadcast band and heard Chris Rainbow VK3JR. I sent him a SWL card and included with his reply was an invitation to come over and see his station. That was really the commencement of my real interest in the hobby, Chris formed classes for the AOCP, which I attended. During this period Will, now my OM, came to my home, after hearing about my new interest, to assist me in mastering the Morse code and general theory. Will had vast electrical experience, due to his profession as an electrical engineer, employed with the State Electricity Commission of Victoria".

The next question that was posed to Austine was equipment. Did she buy or build? *"Bought equipment was almost non existent and we scrounged parts from various shops that catered for the new medium around Melbourne. What we couldn't buy we improvised and made. Crystals were a problem due to availability and cost. I ground mine from old quartz lenses obtained from spectacle shops. This was achieved by grinding with different grades of emery powder on plate glass to the desired frequency. Not always easy, as the properties and cuts of the acquired quartz were not known".*

Wireless Weekly on Friday 3rd April 1931, features a story and picture of, the then, Miss Austine Marshall and quoting a couple of excerpts from the article seems appropriate. *"The writer was informed that quite a lot of our respectable local 'hams' seem to be budding Romeos and during a contact they invariably ask for a photo! As they send a photo of themselves in exchange Miss Marshall has quite a Rogues Gallery, showing the outfits and operators of about fifty stations".*

"Her station, at 650 Dandenong Road, Murrumbeena, is the rendezvous of several of the local boys at least one night per week and any visiting amateur from other States and overseas is always assured of a hearty welcome".

Another excerpt which all amateurs have endured I am sure is also worthy of mention. *"Miss Marshall says: 'When the first station I ever called came back to me, I was almost too excited to key' ".* Brings back memories does it not?

Many years ago during a chat I had with Will, he intimated that it was quite a sight to see Austine, wielding a soldering iron to manufacture or repair a receiver or transmitter. Unfortunately no photographs are available, but one must remember that the soldering equipment and aids available today were unheard of in this period. How would one go in this age of technology, soldering a 48 legged IC into a circuit board with an iron heated on the kitchen gas stove? Not very well, I should imagine!

Austine, became the first and only YL to join the Royal Australian Air Force Wireless Reserve in

Austine, as pictured in Wireless Weekly. (Note the WIA Badge).

1934 and all reservists were divided into various sections of six members/stations. As Austine says *"each member took the responsibility of being Section Commander and we handled thousands of messages overall. I was also District Commander on many occasions and won my share of awards".*

The insignia of the RAAF Wireless Reserve in 1934.

Austine's RAAF Wireless Reserves call sign was 3D6 and her section was VMC4 and she proudly quotes from RAAF Wireless Reserve Notes (AR January 1937) which reads *"3D6 deserves hearty congratulations, not only for winning the Station Trophy but also for the section win to VMC4, which was due in no small measure to the work and initiative of this station".* Austine modestly remarked that the competition was very keen and they won by only a few points.

This lady, a Life Member and Pacific Director of the Old Old Timers Club (OOTC), a pioneer life member of the Society of Wireless Pioneers (SWOP), whom she still keeps regular schedules with members in a 'shack' surrounded by mementos, trophies, and some rare certificates including the DUF 4 Medal and certificates, first YL to receive WAC-YL, third YL worldwide and first VK to achieve WAZ, Yasme Award Certificate (number 7), being a Foundation Member, YL-DXCC from the Canadian Ladies Amateur Association, first VK to receive the ALARA Certificate, and one of the few YLs in the world to display the prestigeous Arabian Knights Award, one condition to the obtaining of this award is to have QSOed His Majesty King Hussein of Jordan, JY1.

Austine, who has other interests apart from amateur radio such as golf and philately, does not remember when she first caught the DX 'bug' or when she achieved her DXCC, but she is near the top and is on the ARRL Honour Roll, no mean achievement, considering that until recently she ran modest power to a dipole and was wholly CW. It is only over the last decade that SSB has become a mode that she has used together with a beam that was erected by her OM Will, at their QTH, on an eight lane highway, the busiest in Melbourne. Austine's QTH has always been on this highway, but at different addresses.

Austine is still 'microphone shy', as she is only occasionally heard on this medium, still preferring her inaugural love of CW, with a straight hand key. When asked if being a YL, gave her an advantage, her reply was *"No, I just felt like one of the boys".*

Austine, is quick to remind readers that when operating in the early days, it was not a transceive operation, one would call CQ and then search the entire band for a reply and the power limit in those days was 25 watts input. Her first rig was a TPTG with a UX210 tube and the three tube receiver, consisted of a detector and two audio stages. The antenna was a full 20 metre Zepp.

Looking back on her first log, this lady reminisces of the 19/12/1931. She says *"I QSOed HC1FG and that country gave me WAC, was I happy; then I QSOed KGEG, the yacht 'Northern Light' from the USA and GX2TM aboard the MV 'Daga', with its registry in London, what a day! When the vessel arrived in Melbourne, the Captain, Wireless Operator Tom Miller and the ships medico visited me! It was quite a thrill".*

At the commencement of WWII, when all amateur stations were closed down, Austine taught Morse code for the WIA, at the rooms In Melbourne. At the cessation of hostilities, amateur radio was to the fore, this time with Type 3 Mark II war surplus equipment that used the familiar 6L6 tubes and weighed about 22 kilograms, this rig lasted for many years operating on the 20 metre band. Needing crystals, it was back to the grinding process again and over a period there was quite a stock but not enough to cover the entire 20 metre band of course.

Austine who has been a WIA member since before being licenced says *"that each award has given me great pleasure and to answer your question of the greatest thrill I have had from the hobby is hard, but I feel my involvement in the RAAF has been the highlight of my amateur career so far".*

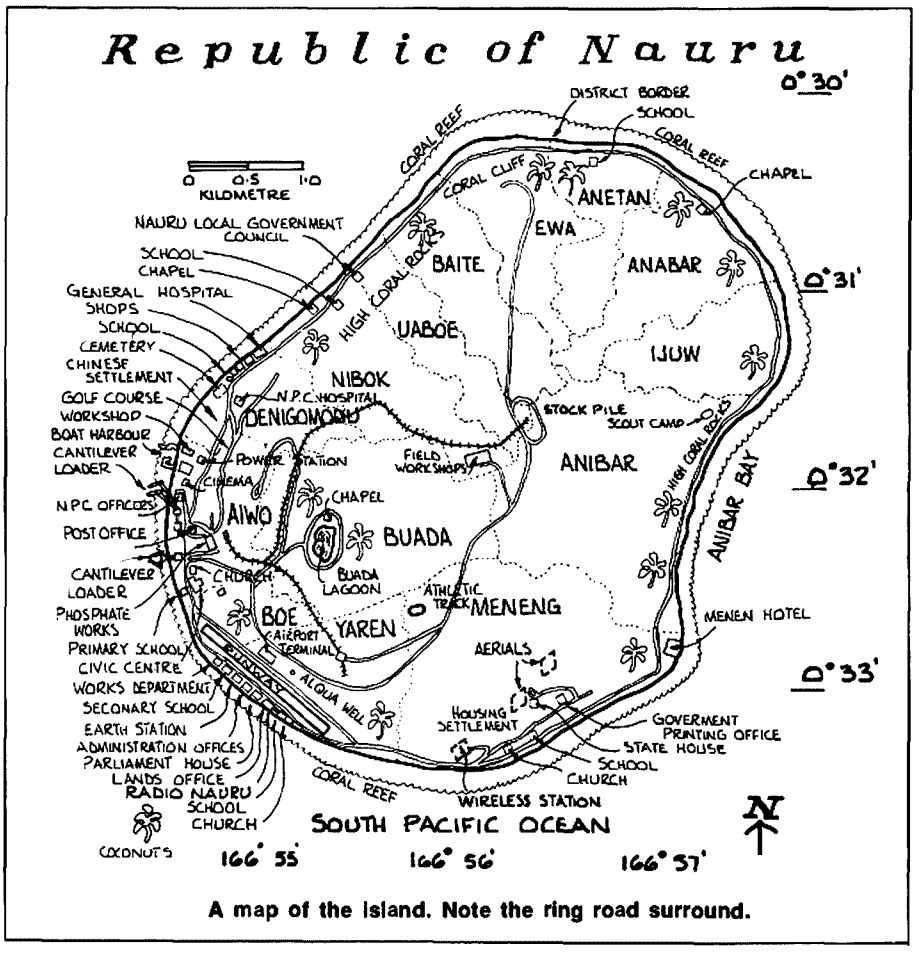
Quite a history for a lady that has spanned in excess of half a century with a hobby that has brought her lasting friendships worldwide, believes patience and persistence have allowed her to achieve the goals she has set herself, and asked if knowing what you know now, would you do it over again. The unpremeditated answer in Austine's own words was *"I would do it all over again DX wise and otherwise — you see I never tned to ever put radio first, it was my hobby and I still want a country or two, if not on CW, then on phone".*

Quite a history Austine, unfortunately space doesn't permit elaboration of many other facets of your hobby career, but long may you 'pound the brass' and be heard on SSB, seeking the DX that you deserve, with the continued encouragement of the OM, Will. These personal sentiments I am sure are supported by all readers of this column and DXers world wide. Congratulations on your contribution to our hobby.

NAURU: THE FUTURE?

The President of the Republic of Nauru, His Excellency the President, Hammer de Roburt, GCMG, OBE, MP, in a recent television interview, spoke of the problems facing his people in the next decade.

Originally named "Pleasant", because of its lush appearance, by an English explorer in 1878, this island was annexed to Germany in 1888 and



A map of the Island. Note the ring road surround.

since has had quite a chequered history, including being annexed to Australia on two occasions, until it was granted independence and created a Republic in 1968.

Nauru, generally hot and humid, with an unpredictable rainfall of 2000mm annually, is surrounded by a flat coastal belt approximately 150 metres wide, fringed by a 200 metre coral reef. The island is of volcanic origin and rises 4800 metres above the sea bed, having an average height of 50 metres above sea level. This Republic, on looking at a map, is seen as a dot located near the equator in the vast Pacific Ocean, having an area of 20 square kilometres and a population in the vicinity of 7250 which is made up of twelve different races, mostly of Polynesian and Micronesian descent, settled in the districts of Ewa, Anetan, Anabar, Ijuw, Anibare, Meneng, Yaren, Boe, Aiwo, Denigomdou, Nibok, Uaboe, Buada and Baite. Each of these races are symbolised by a point of the star depicted on their national flag which is coloured blue with a gold band across the middle, representing the equator and a twelve pointed star depicted in white in the bottom left hand corner.

This Republic, one of the world's smallest and probably the richest, boasts its own airline that has grown to service adjacent islands and is now in its fifteenth year of operation. Apart from civil aviation, shipping interests have not been neglected. The Government Council owns and operates a number of vessels, including cargo passenger liners, bulk carriers (one with a specialist tanker facility for carrying the island's petroleum requirements). Also under the auspices of the Nauru Fishing Corporation, which is government owned, specialist fishing boats are pressed into service to tap the rich adjacent fishing grounds.

The source of the phosphate deposits has not been established beyond doubt, however the hypothesis is that the island's deposits are from marine origins, where organic matter (plant and animal remains and fecal pellets) in highly fertile tropical waters sinks to the sea bed, and the decay of these remains form phosphate pellets in the sediment, which is already rich in minerals.

The area has been mined since the turn of the century, when the royalty to landholders was in the vicinity of one half penny per ton. In a period of five years it is estimated that 630,000 tons was shipped out for a sale value of 945,000 pounds sterling. Royalties for the period were 1320 pounds. Mining has continued with a presently estimated extraction of 1,750,000 tonnes annually, until there is very little left of the third of the island that has been set aside for claiming the phosphate. Over 60 percent of the revenue received is invested in long term trusts. One such investment is the unusually designed magnificent 52 storeyed building, Nauru House, located in the centre of Melbourne. What is left of the mining area is unusable undulating crannies and nooks that are useful for nothing, except probably for playing "hide and seek", if you feel that way inclined.

Nauru, as seen from the air.

Communications on the island have improved since the Republic installed a satellite earth station in 1975, giving access to the world via Australia and Hong Kong. International telex, telegraph and telephone links operate around the clock as does a 1200 line automatic inter-island telephone. Recreational facilities are excellent, including fishing, tennis, basketball and even Australian Rules Football is played.

It appears that the Republic, due to nearly having exhausted its main exportable product, phosphate, is very concerned as to what the future holds and the administrators are looking for alternate accommodation for their people, by trying to buy an island that will not drastically change the lifestyle of its small population.

In the future, will the prefix C21 become a rarity or a call of the past and will another prefix be heard on the amateur spectrum? Only time will tell.

Liz W3CDQ (see How's DX December).

A DX CLUB TO JOIN

A DX Club, with in excess of 400 members, has opened its doors to overseas amateurs. This club has a most comprehensive QSL directory, programmes for computers, books and information on awards and contests, to name but a few of their services.

All one has to do to apply for membership is to write, enclosing 1 IRC, (I recommend 3 in this instance), to Mario Ambrosi, I1MQP, ARI DX Club, via Stradella 13, 20129, Milano, Italy.

COMPANY

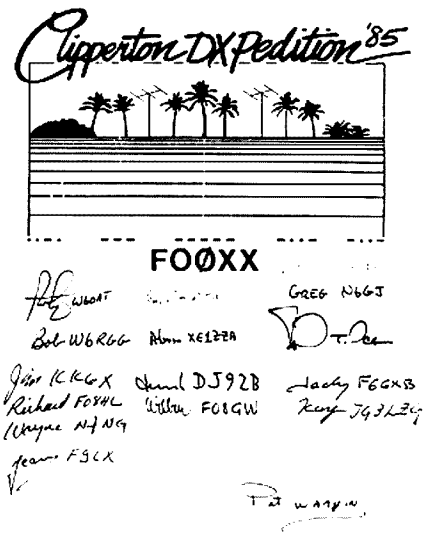
Les 7Q7LW, has some company. G3TBK is in the country and expects to be QRV for several months. It seems that he may pool the equipment he has with Les and operate from his QTH. Remember, Les 7Q7LW's XYL loves to receive stamps when you QSL to him.

COUNCIL OF EUROPE: CALL TP2I

The Council, based at the 'Palais de l'Europe' in Strasbourg, France was formed in 1949 and comprises the countries of Austria, Belgium, Cyprus, Denmark, the Federal Republic of Germany, France, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

The Committee of Ministers, comprising the Foreign Ministers from each member country, who hold the chairmanship in turn, strive for the protection of democracy, human dignitity, improvement in living standards, protection of fauna and flora, safeguard of the architectural heritage and provision of facilities for the younger generation with training and sport to mention but a few of their aims. They conservatively represent the interests of some 385 million Europeans.

The amateur station is managed by F6FQK and QSLs are handled by F6EYS. The address is TP2I, C/- Council of Europe, BP 431/R6, 67006 Strasbourg Cedex, France.



You should have your QSL card from this Expedition by now!

WARC BAND INCENTIVE

The WARC 24 MHz Band has had a "shot in the arm" with the inception of the 12-12 WORLDWIDE CLUB. Charter Membership is available until June 1986 and to qualify you must make contact with a 12-12 Director or official station. After this date, one will be required to work 12 members and request their lifetime numbers.

A Newsletter, on a quarterly basis, is available as one of the benefits. Further information may be obtained by writing to 12- 12 World Wide, C/- Steve Walz, WA5UTO, PO Box 222, Cherokee, OK 73728, USA with a SAE plus a couple of IRCs.

YI8BGD

The operators apparently are being allowed more freedom in what they can do. Quite a few are quoting individual box numbers for QSLing, **but** pay attention to the box number they quote and each individuals name as they will be the only ones that hold the logs for that operation. Also remember, IRCs are the correct order of the day for this country.

QSL CARDS ABANDONED? ?

I was horrified to read in the VK4 mini magazine 'QTC' for November last year, the staggering number of amateurs in that state who had cards waiting for them at the bureau. I lost count after I got past the 465 call signs that were on the published list.

One cannot but wonder if it is worth QSLing if this is the apathy that is shown and could it be typical in this country or world-wide? A quick check with the VK3 Bureau showed that in excess of 30 000 cards have been uncollected over the last five years. What happens in other states or countries we are unaware of, but this may generate some feed back which I will be passed on to the readers.

LET US GET IT RIGHT

The following are the correct QSL addresses for some of the stations operating out of BY-land.

BY0AA PO Box 202, Wulumqi.
BY1PK PO Box 6106, Beijing.
BY1QH PO Box 2654, Beijing.
BY1SK PO Box 2916, Beijing.
BY4AA PO Box 205, Shanghai.
BY5RA PO Box 730, Fouzou.
BY5RF PO Box 209, Fouzou.
BY8AA PO Box 607, Chengdu.
BY8AC PO Box 607, Chengdu.

After each address the wording of Peoples Republic of China should be added.

It is interesting to note that BY0AA is located in Xinjuan Uygar which is within the borders of the rare Zone 23, a helpful one for WAZ.

FCC BUSY

The Federal Communications Commission in the United States apparently is quite busy in the courts, who have been handing out some hefty fines for use of excessive power, out of band operation and illegal use of the amateur band. Many other prosecutions are being prepared and pending court appearances.

ALCATRAZ

If you worked W6AK on the 5th and 6th of October last year, it was the Sacremento Amateur Radio Club operating from Alcatraz Island. A special QSL card has been struck and is obtainable from SAC, PO Box 161903, Sacremento, CA 95816-1903, USA. A SAE and 2 IRCs should suffice.

ODDS AND ENDS

Laydoh 1Z9 is operational again, but still doesn't count for DXCC. * * Alain 6W1HB/7O, hopes to be back and 'operational' again until March. He also, doesn't count for DXCC at the present. * * More TAs expected on the bands soon, after the recent examinations that were held. * * The 'Globetrotting' Colvins quite active on CW and SSB from the African Continent. * * New station from the Peoples Republic of China is BY4AOM and signals emanate from the Shanghai Institute of Electronics. * * TR8JD claims to be the QSL route for all TRs. * * If the BYs operate from Pratas Island it should not count for a new DXCC Country as it is only 210 km from the mainland and under the Peoples Republic of China administration. * * 10MHz enthusiasts watch for K0WTM/HC1 around 10.101 to 10.104 MHz. * * T2WWL and T2MPL, Ward and Madge Little who are missionaries have become active from Tuvulu. * * 5N25RTF was used to celebrate 25 years of Independence. QSL to DK2IF. * * DK5CQ/VK9L hopes to be active until at least the end of February. * * C53FA, who is DJ9EH, hopes to be QRV until July in his off duty time from Radio Gambia. * * Two new member countries to the IARU are the Kuwait Amateur Radio Society (KARS) and the Brunei Amateur Radio Society (BARTS). The IARU membership now stands at 81. * * The QSL Managers for the 7S activity from Sweden are still awaiting the printing of the special card.

THANKS

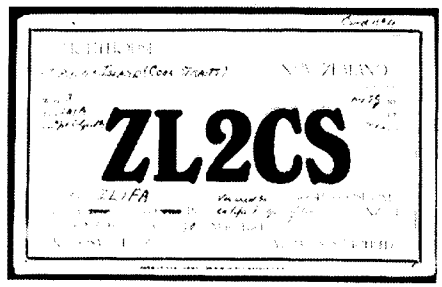
Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-QSO, DX FAMILY FOUNDATION NEWSLETTER, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF RFPORTS, LONG ISLAND DX BULLETIN, ORZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, cqDX, JA CQ, JARL NEWS, KARL NEWS, QST, RADCOM, VERON and WORLD RADIO.

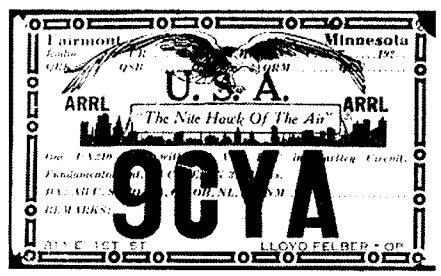
Members who have contributed include VKs 2HD, PS, EBX, 3YJ, YL, and G3NBC. Overseas amateurs include G1EOD, KB6OAW/KH2, ON7WW, W3CDQ, WB6GFJ and ZL1AMM. A HAPPY NEW YEAR and thanks to one and all.

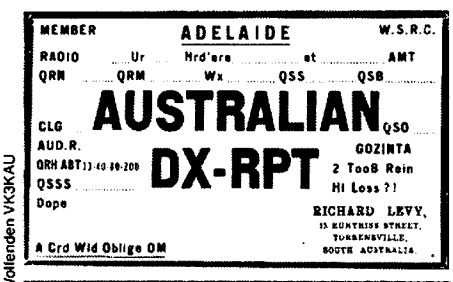
AR

QTHs YOU MAY NEED

3D6BD	Eric Engen, 2804 Spencerville Road, Burtonsville, MD 20866, USA.
3B9FR	Franz Langer, Carl Kistnerstr.19, D-7800 Freiburg, FRG.
4S7VK	Same as 3B9FR.
6W1MS	PO Box 950, Dakar, Senegal.
8Q7AV	Noel Lokuge, "Four Winds", Majeedi Road, Male, Maldive Islands.
9M2MM	Operator Mark only: PO Box 10035, Kuala Lumpur, Malaysia.
9Y4KB	PO Box 1167, Trinidad.
A24SC	Steve Craggs, High Pitt Rd, Cramlington, Northumber, UK.
A71AD	PO Box 4747, Doha, State of Qatar.
A71BK	PO Box 1556, Doha, State of Qatar.
BY1QH	PO Box 2654, Beijing, People's Republic of China.
CE0FFD	PO Box 4, Easter Island, via Chile.
CE0FQV	PO Box 59, Easter Island, via Chile.
ED1ISI	Jose Suarez Souto, Cores, Puenteceso, La Coruna, Spain.
FO8JP	Daniel Taquet, La Petite Rue, F-02170, Esqueheries, France.
FY5BO	Guy Faubert, BP 856, F-97303, Cayenne, French Guiana.
HC8E	PO Box 289, Quito, Ecuador.
KA8GVS/ KH2	315 Horne Street, NCWP, Guam Island, FPO, San Francisco, California 96630 USA.
KC6IN	PO Box 296, Ponape, Eastern Caroline Islands, 96941. USA.
TA1C	PO Box 188, Istanbul, Turkey.
TA1D	PO Box 167, Istanbul, Turkey.
TR8JYC	PO Box 2E827, Libreville, The Gabon.
TT8AQ	Jacques Calvo, BP 70, F-91605 Savigny Cedex, France.
VP2EZ	J White, General Delivery, The Valley, Anguilla.
ZD7XY	PO Box 54, St Helena Is, South Atlantic.







Antique QSL Cards courtesy of Peter Wollenden VK3KAU

KNOW YOUR SECOND HAND EQUIPMENT

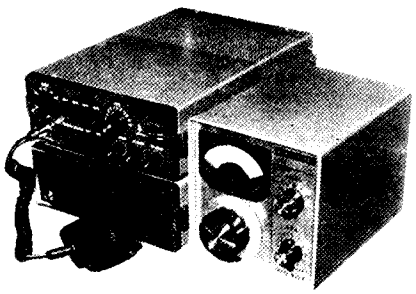
A Series to Help You Identify Amateur Equipment

This month, and next, we will conclude our look at the early Yaesu equipment for the time being. However, we will return to the Yaesu stable later in the series to discuss more of their prolific output.

YAESU FT-75 TRANSCEIVER

First announced in Australia in August 1972, the FT-75 was, to say the least, different. It was an all-band 80 to 10 metre transceiver with an advanced design solid state receiver and exciter, with a valve driver and final stage using a 12BY7 and 12DQ6B. Power output was in the order of 30 watts.

Both transmit and receive frequencies were crystal controlled, but these could be shifted to some extent by a VXO circuit. There was provision for three crystals for each band and a total of fifteen could be installed. For the time, the FT-75 was very compact, measuring 80 x 210 x 300mm and weighing 3.8kg.



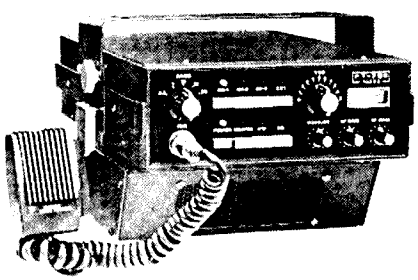
As a tube final was used, a power supply was required for both AC and 12 volts operation. These were housed in separate cabinets the same size as the transceiver and a stacking type mobile mount was available. For home station use with the AC supply, it was possible to team the FT-75 with the FV-50 series VFO to give full band coverage. However, the FV-50 was not noted for its stability and results were not always satisfactory.

In its original application, as a mobile transceiver, it could still prove most useful, so long as you could put up with three slightly plus and minus frequencies.

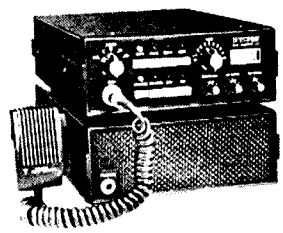
Original prices were: FT-75 Transceiver $296. FP-75 AC power supply $53.50. DC-75 12 volt DC power supply $53.50, and the FV- 50C VFO was $49.50. Second-hand value today would be around $175 for the entire group. A review of the FT-75 appeared in the September 1972 issue of Amateur Radio.

YAESU FT-75B TRANSCEIVER

Released early in 1974, the 75B was very similar to the earlier FT-75, however, power output was doubled by the use of two 12DQ6Bs in the final. With extra power, the power supplies were uprated. Prices were the same as the FT-75 initially, but later in its popularity the FT-75B actually dropped in price to $238. Second-hand value today would be about the same as the FT- 75.



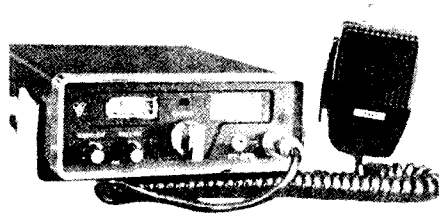
The FT-75 with mobile mounting bracket and DC-75 power supply.



The FT-75 with FP-75 AC power supply.

YAESU FT-2F TRANSCEIVER

This 2 metre FM transceiver was released in early 1971. I well remember the first time I saw an FT-2F unit. Having been used to the ex-commercial, tube-type FM transceivers, I was amazed that it could all be fitted into such a compact box. The FT-2 was a 12 channel transceiver with 10 watts RF output, and of course, was fully solid-state. An 'S', come relative output meter, balanced the channel display on the other side of the channel selector knob.



A set of transfers was supplied so that the appropriate frequency could be attached to the dial. Two crystals were required for each channel, a 6MHz for the transmitter and a 45MHz for the receiver. The transmit crystal has a trimmer to enable the frequency to be set, but the receive crystal could not be stabilised. This, in fact, was the greatest problem with the FT-2F As the crystals aged, they gradually drifted off frequency, producing both poor audio quality and incurable ignition noise under mobile conditions.

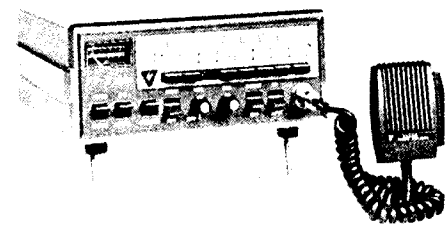
Price when new was $269, with three channels supplied. Second-hand value today would be about $60, depending on the number of channels installed.

YAESU FT-2FB 2 METRE FM TRANSCEIVER

The FT-2FB has the same appearance as the FT-2 and was introduced to the Australian market in August 1972. The 2FB was improved in many aspects, when compared to the FT-2. Both the transmit and receive crystal frequencies were revised to improve stability, and to give the facility to net the receiver to an exact frequency. Transmit crystals were on 18MHz and the receiver on 15MHz. In fact, the crystals were inter-changeable with the Icom IC-22 series crystals with just a very slight modification to the padder capacitor values. As Icom crystals were always easier to obtain than their Yaesu equivalents, most FT-2FBs were modified in this way, and 12 crystals were available.

The FT-2FB was capable of excellent performance with receiver sensitivity only slightly down on current two metre equipment. Audio quality on both transmit and receive was excellent. A matching AC power supply, the FP-2AC was an option for the FT-2 and FT2-FB.

Price when new with three channels installed was $259. Second-hand value today is about $85, again depending on the number of channels installed. Extra channels over about four or five would be worth about $5 each, as long as they are of use to you.



YAESU FT-2 AUTO.

The FT-2 Auto is an FT-2FB with a built-in AC power supply and a channel scanning facility for eight channels — quite a useful facility if you need to monitor a few local FM frequencies. All other features are similar to the FT-2FB.

Price when new, with three channels installed was $398. Value today would be about $100.

AR

Next month we will take a look at the various models of the infamous Yaesu FT-101.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

Another year has come and gone, and as 1985 fades away into the distance, it seems a good opportunity to look back over some of the outstanding occurrences in ALARA's tenth birthday year.

It has been a most important milestone when we consider our very small beginnings on 26th July 1975, which has been admirably documented by Mavis VK3KS, in her History of ALARA.

In those days, licensed YL operators were few and far between, but during the ten years of its existence, ALARA has grown from a mere handful, to over 200 members, active in all facets of amateur radio, and justly proud of their achievements.

While giving ourselves a pat on the back, let us not forget the OMs who have supported and encouraged us along the way, and to whom we would like to extend a sincere vote of thanks.

To mark the occasion, very enjoyable birthday lunches and get-togethers were held in VKs 2, 3, 4, 5, and 6, with participants voting to hold similar functions in the future. (Well, we don't really need an excuse, do we?)

A birthday mini-contest was held on 6th July and was won by Kim VK3CYL, with Gwen VK3DYL, a very close runner-up.

During 1985, ALARA members were involved with many activities, including WICEN, JOTA, Educational Programmes, and CW Sessions.

On 6th January 1985, YL Activity Day, VI3WI was activated on a roster basis by VK3 YLs.

Gill VK6YL, and Christine VK6ZLZ, were active in the John Moyle Field Day Contest from Penguin Island, 50km south of Perth. In the same contest, Bev VK6DE, and a group of Geraldton amateurs, operating from a beach, were interviewed for a local paper.

Helene VK7HD, was interviewed by the ABC about YL interest in amateur radio, and was assisted in demonstrating operating procedures by several ALARA members.

At the Tasmanian Amateur Radio Convention, ALARA members operated a highly successful publicity stand, and were allocated the call sign VK75A for one hour each day. This call sign was used by Connie VK4ATK, on 12th August.

Grace VK7NNN.

WIA 75th Anniversary Book Pack Presentations were made on behalf of ALARA to the Regency Park Centre for the Young Disabled by Jenny VK5ANW, and Marlene VK5QO, and to the Dalby Agricultural College by Margaret VK4AOE.

Margaret was also interviewed on television for the programme "Here Tonight".

Joan VK3NLO, appeared on local television to speak about and demonstrate amateur radio.

Many members were active in amateur radio organisations, notably Jenny VK5ANW, WIA (SA Division) Councillor, Gill VK6YL, Secretary of WARG, Christine VK6ZLZ, WIA (WA Division) Councillor, Diane VK6KYL, Secretary of Goldfields Radio Club, Bev VK6DE, Geraldton Radio Group segment of VK6 WIA News.

These are only a few of the many who have helped over the past year to put ALARA "on the map".

On the artistic side, we were delighted with the donation of a beautifully crocheted commemorative table-centre from Margaret VK4AOE, which was subsequently the first prize in the birthday mini-contest. Marlene VK5QO, gave us the "jazzy" cover on our birthday edition of the newsletter, and Valda, the artwork on our stickers, and especially the lovely Award Birthday Stickers. I was lucky enough to receive one of these, a much admired addition to my Award.

Marlene VK5QO, wrote the most interesting and informative 75th Anniversary Special for AR on the WIA beginnings in South Australia.

A very important achievement for ALARA was being the first organisation to affiliate Federally with the WIA.

On a sad note, Margaret VK2AHD, Val VK4FKL, and Verle VK2MR became silent keys, and are greatly missed by us all.

There were a few changes in the Committee, and hopefully the "cogs that keep the machinery running" will function as smoothly as they have in the past.

Right Girls! Let us see what we can do with 1986.

Don't forget the official Monday night nets during Daylight Saving Time begin at 1000UTC.

In conclusion, a very happy New Year to all.

33/73, Joy VK2EBX
AR

Jan VK3NCA.

THE GREAT 75TH WIA ANNIVERSARY 1910 — 1985

A Volunteer Bus Driver's View.

Geoff Tresise VK3CNX
20 Lorimer Street, South Melbourne, Vic. 3205

The Wireless Institute of Australia was 75 years old in 1985, and the Federal Executive decided to make the birthday a real landmark in its, already, colourful history. It was decided that this memorable occasion should not only include members living in Australia and abroad, but to extend invitations to many and varied interested communicators all over the world.

Now, how on earth could such a large and gala affair as the WIA's 75th Anniversary Dinner affect me? About three weeks prior to the event, I heard a plea for volunteers from the amateur fraternity, on the VK3 WIA Broadcast, for people to drive buses, which would be used to shuttle the overseas guests to and from the airport, and other sightseeing tours that had been arranged by Executive. The guests drew lots each day to decide which trip would suit their needs for the day.

It appeared that the most popular trips were visits to the Melbourne Zoo, the Arts and Entertainment Centre, the Fitzroy and Botanical Gardens, and just touring around the City on sightseeing tours.

There were several side-trips, and barbeques at the homes of various amateurs. I was fortunate to take a large contingent of Japanese visitors to the home of Bruce and Gwen Bathols, VK3UV, where every one had a delightful evening, thanks to the hosts.

There was another bus which ventured to Philip Island to witness the beaching of the fairy penguins, in the evening and to see some koalas in their natural habitat.

And enjoy themselves the guest certainly did, as their repeated requests for varied trips showed. The various trips and outings were offered by the hosts so that not one minute of their time would be idle and lacking in interest.

The weather for the entire occasion remained fairly stable — hot to warm and humid — but on my first day in the bus at Tullamarine Airport, to meet some overseas guests, the sky appeared to open up with flashes of lightning, thunder and a three- quarter of an hour hail-storm, with hail-stones as large as golf balls.

In all, the whole event evolved with nary a hitch, although some last-minute changes in some trips were made. During the whole exercise, the bus drivers and co-ordinators (at the Southern Cross Hotel) kept in touch using hand-held equipment, employing FM channel 6500 simplex, and channel 6850, Mount Macedon Repeater.

Every whim of the guests was catered for, and it will remain in their minds for a long time to come.

Thanks must go to all concerned with the planning and organisation of the whole event, with special thanks to Earl Russell VK3BER, Peter Wolfenden VK3KAU, Alan Noble VK3BBM, Bruce Bathols VK3UV, all drivers of the buses, and people who loaned equipment for the duration of the exercise.

Special thanks to the Federal Executive of the WIA for arranging such a magnificent event, and we can certainly look forward to the first Amateur Radio Society Centenary, in 2010.

AR

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

SAMPLE EXAMINATION PAPER FOR AOCP THEORY

This month, an examination paper for AOCP Theory is presented for all to test their knowledge. Select the correct or most appropriate alternative. Answers appear at the end of this paper.

1 The third harmonic of a transmission at 7.1MHz is:

a 2.36MHz.
b 10.1MHz.
c 21.3MHz.
d 28.43MHz.

2 For a given inductance, as the applied frequency is increased the reactance will:

a increase.
b decrease.
c be unchanged.
d approach the resistance value.

3 The velocity factor of a radio wave is:

a the speed at which it travels in a dielectric.
b the speed of light.
c 0.66.
d the ratio of its speed in a medium to its speed in free space.

4 To use a FET voltmeter to measure AC voltages it is necessary to:

a provide switching for different current ranges.
b provide switching for different frequency ranges.
c increase the resistance of the input probe.
d provide a probe containing a rectifier.

5 The PIV rating of a silicon diode in a half-wave rectifier should be:

a twice the expected RMS voltage of the secondary.
b at least equal to the peak-to-peak voltage of the secondary.
c equal to the peak voltage of the secondary.
d about half the peak voltage of the primary.

6 A well regulated power supply is one in which:

a the internal temperature remains constant.
b all filter capacitors are by-passed by bleeder resistors.
c there is very little voltage ripple in the output.
d no RF output is produced.

7 In any antenna there will be a current minimum at:

a the feedpoint.
b each quarter wave interval.
c ½ wave intervals.
d the ends of the antenna.

8 The Carrier Insertion Oscillator in an SSB receiver may have two crystals, which:

a allows large frequency adjustments to be made.
b provides selectable upper or lower sideband reception.
c improves the audio quality.
d may generate twice as many spurious signals.

9 A trapezoidal pattern is displayed on a cathode ray tube when:

a alternating voltage inputs are applied to both X and Y axes.
b two alternating voltages are applied to the X axis.
c an alternating voltage is applied to the Y axis and the X axis is earthed.
d an intermittent DC is applied to the X axis and the Y axis is earthed.

10 When two HF transmissions are made from the same location under identical conditions, the one with the lower angle of radiation will:

a have more extended skip zone.
b give rise to less tropospheric scatter.
c be more likely to be absorbed by the F layer.
d be less affected by sunspot variations.

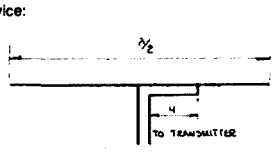
11 Antenna matching devices:

a provide a low SWR at the transmitter.
b prevent a flat line.
c ensure efficient power transfer to the antenna.
d prevent harmonic radiation.

12 Amateur transmissions on 1.8MHz may be detected by broadcast band receivers in close proximity due to:

a long antennas.
b a very long sky wave component.
c ionospheric propagation being more effective at night.
d the usually low IF of a broadcast band receiver.

13 This device:



a can be used to match antenna impedance to line impedance by varying dimension 'y'.
b is commonly known as a 'Delta match'.
c can be used only if balanced feedline is used.
d will reduce the radiation of harmonics so long as 'y' is more than a quarter wave length.

14 The transfer of intelligence from a strong unwanted signal to a weak wanted signal is known as:

a IF stage overload.
b cross-modulation.
c harmonic distortion.
d intermodulation distortion.

15 The power loss at UHF through a good quality PL259/SO239 plug and socket combination is significant because the:

a radius of the plug is a significant fraction of one wavelength.
b surface area of the inner conductor allows radiation from surface currents.
c the connectors are large and act as heat sinks.
d plug and socket surfaces are not very close contact.

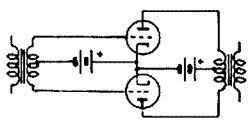
16 A receiver which has poor sensitivity on 21MHz may be adequate at 3.5MHz because:

a atmospheric noise can be the limiting factor at 3.5MHz.
b selectivity is better at 3.5MHz.
c of the effect of two RF stages.
d of the low second IF.

17 As a general rule, good HF transmitter design requires that:

a the VFO should be isolated.
b temperature compensation should be set immediately after switch on.
c pi-network tank circuits should be avoided to limit harmonic generation.
d PA input circuits be screened.

18 In this amplifier circuit tha:



a vacuum tubes will be operating in Class A.
b two vacuum tubes are connected in push-pull.
c outputs of both tubes will be in phase.
d vacuum tubes are connected in parallel.

19 The harmful effects of an electric shock on the human body depend primarily on the:

a voltage applied.
b length of time of the contact.
c magnitude and path of the current.
d frequency of the applied voltage.

20 Of three television receivers being used in close proximity to an amateur station, only one suffers severe interference when the station transmits SSB signals. The cause is probably:

a a distorted field strength pattern.
b excessive harmonic radiation.
c a receiver fault.
d faulty transmitter antenna connections.

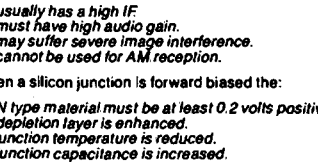
21 A direct conversion receiver:

a usually has a high IF.
b must have high audio gain.
c may suffer severe image interference.
d cannot be used for AM reception.

22 When a silicon junction is forward biased the:

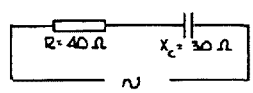
a N type material must be at least 0.2 volts positive.
b depletion layer is enhanced.
c junction temperature is reduced.
d junction capacitance is increased.

23 This circuit is:



a an Armstrong oscillator.
b a Hartley oscillator.
c an audio amplifier stage.
d a buffer amplifier stage.

24 The total impedance of this circuit is:



a 10 ohms.
b 8.5 ohms.
c 70 ohms.
d 50 ohms.

25 'Virtual Height' of an ionospheric layer is the height:

a at which the first refraction occurs.
b at which the most intense belt of ionisation occurs.
c at which a simple reflection would give the same propagation effects.
d which is necessary before multi-hop propagation can be effective.

26 An effective method of transmitting on the 70cm band could be to use a 144MHz transmitter and:

a a high pass filter.
b a high gain 70cm antenna.
c two doubler amplifiers.
d a varactor tripler.

27 Interference caused by power leaks from mains supply lines usually results from:

a line voltage variations.
b shiny insulators.
c loose wooden poles.
d comparatively low resistance paths to earth.

28 A 240 volt power transformer is designed to supply 24 amps at 20 volts from the secondary. Ignoring losses, the primary current will be:

a 2 amps.
b 5 amps.
c 10 amps.
d 24 amps.

29 'Damping' of a moving coil meter is usually achieved by:

a having the coils wound on an aluminium former.
b tightening the springs attached to the coil.
c increasing the intensity of the magnetic field.
d minimising needle bearing friction losses.

30 In a power supply using a transistorised DC-DC converter:

a there is no need for a transformer.
b the input DC is usually switched by one or two power transistors.
c a power transfer efficiency of 100 percent can be achieved.
d filtering is unnecessary

31 A solid state device incorporating four layers of P and N material is called a:

a silicon controlled rectifier.
b PNPN transistor.
c full wave rectifier.
d voltage regulator.

32 The susceptibility to received RFI noise may be reduced by:

a using a vertical quarter wave-length antenna.
b using a vertical five-eighths wave-length antenna.
c a good earthing system.
d listening on the lowest frequency band.

33 A keying filter circuit is designed so that:

a it sharpens the rise and fall time of each pulse.
b it runs each pulse smoothly into the next.
c its effectiveness is determined by the time constant of its RC circuit.
d sparking at the key contacts is minimised.

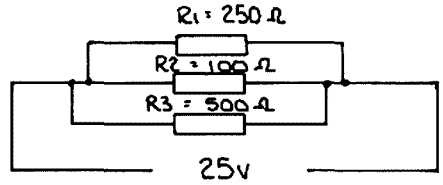
34 Communication via tropospheric propagation:

a can occur only when a temperature inversion occurs.
b requires horizontal polarisation of the antenna.
c is more likely to be effective over land than over water.
d is more likely to be effective at VHF and UHF than at HF.

35 A Class AB amplifier:

a can only be used at RF.
b will have higher efficiency and power output than Class A.
c has an operating angle for each tube of less than 180 degrees.
d will provide high distortion at AF.

36 The power dissipated in R1 will be:



a twice that dissipated in R3.
b two and one half times that dissipated in R2.
c about 0.6 watt.
d about 1.0 watt.

37 Discharge from a conductor which is within the field of a high voltage power line is:

a electromagnetic discharge.
b induced derived interference.
c electrostatic discharge.
d electric field interference.

38 A double conversion receiver tuned to the 10 metre band is found to also respond to a 52MHz amateur signal. This is probably due to:

a a local oscillator frequency of 40MHz.
b internal spurious signals in the receiver.
c third harmonic radiation.
d the low second IF.

39 The fundamental carrier crystal for a 144MHz FM transmitter operates at 6MHz. To achieve 3kHz deviation at the transmitter output, the deviation of the fundamental oscillator must be:

a 18 times greater.
b about 166Hz.
c more than 3kHz.
d 18kHz.

40 Communication between two stations by means of amateur satellites is only possible:

a on bands above 420MHz.
b when both stations are directly under the satellites orbital path.
c when the satellite is in a geostationary orbit.
d if the satellite is above the horizon with reference to both stations.

41 A SSB communication system filter designed for use at 455kHz is likely to be:

a a two section LC filter.
b a four varactor device.
c a mechanical filter.
d in the first IF section of the receiver section.

42 A 'long wire' antenna is most effective when:

a centre fed with balanced twin lead.
b slightly less in length than a multiple of a half wavelength.
c operated only at odd harmonics of its resonant frequency.
d vertically polarised.

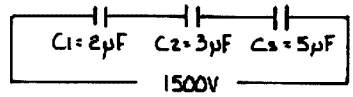
43 Excessive FM on the output of an SSB transmitter may be caused by:

a poor regulation of the power supply.
b poor selectivity of the final tank circuit.
c inadequate carrier suppression.
d a failure at the buffer amplifier stage.

44 The value of a resistor which is colour coded brown, black, gold, gold is:

a 1M ohm 5% tolerance.
b 100 ohm 5% tolerance.
c 2100 ohms 10% tolerance.
d 1 ohm 5% tolerance.

45 In this circuit, the voltage drop across:



a C3 is equal to that across C1 + C2.
b each capacitor is the same.
c C3 is the greatest.
d C1 is the greatest.

46 A fuse in the output of a mains operated DC power supply should be:

a rated at twice the input peak current.
b connected in the earth lead of the largest electrolytic capacitor.
c rated at at least twice the expected peak current.
d rated at slightly more than the normal operating current.

47 A microphone which consists of a pair of charged plates but does not require a bias voltage is the:

a carbon.
b electret.
c ceramic.
d dynamic.

48 To increase the power output of a transmitter by 6 decibels it would need to be:

a doubled.
b tripled.
c quadrupled.
d multiplied by ten.

49 A bipolar transistor operating in a circuit with a voltage gain of less than 1:

a is in a common emitter configuration.
b has a high harmonic output.
c is likely to be an emitter follower.
d must be an NPN transistor.

50 An advantage of using a FET as a buffer amplifier is that it:

a provides a low impedance.
b provides a variable impedance load.
c minimises loading on the output of the previous circuit.
d provides maximum harmonic generation.

ANSWERS TO QUESTIONS — AOCP THEORY

1 c	11 c	21 b	31 a	41 c
2 a	12 d	22 d	32 c	42 b
3 d	13 a	23 b	33 c	43 a
4 d	14 b	24 d	34 d	44 d
5 b	15 a	25 c	35 b	45 d
6 c	16 a	26 d	36 a	46 d
7 d	17 a	27 d	37 c	47 b
8 b	18 b	28 a	38 a	48 c
9 a	19 c	29 a	39 b	49 c
10 a	20 c	30 b	40 d	50 c

RTTY PIONEER TELLS HOW IT ALL BEGAN

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

Eric Ferguson VK3KF has been operating RTTY for some 30 years and remembers the early days, including a struggle to get the mode approved. The 78 year old said, his first involvement began in the early 1950s, while working with the Department of Civil Aviation.

In the Department's Research Laboratory he experimented with methods of getting efficient and reliable RTTY on HF networks covering Australia and its Territories.

Eric said it became a full time job developing systems such as "Twinplex" mode, which doubled the traffic handling capability of the conventional simplex mode. The first amateur RTTY was in 1957, after Forest Castle KR6AK, an American Servicemen in Okinawa asked Eric about RTTY.

"I could only reply that I knew of no such activity, but added I was technically involved, as part of my work.

"It was arranged for me to listen for Forest on equipment at work on a 21MHz frequency," he said.

The first attempt failed because Eric's equipment was set at 50 BAUD. The speed was changed to 45.45 BAUD and a short time later a good print-out was achieved.

Eric was satisfied at leaving his amateur RTTY operation right there, but Forest pushed for a two-way RTTY contact. Eric then used a borrowed Test and Distortion Measuring set and sent 'The Quick Brown Fox' test to KR6AK. Forest only renewed his arm twisting with increased vigor for a two-way QSO.

"The thinking cap was donned and it came to mind that a crystal controlled FSK oscillator I had developed mainly for the Twinplex mode could easily be adapted to excite the VK3KF transmitter.

"Almost overnight, a simplified version was knocked up and by sorting through a box of crystals, one was found with a fourth harmonic giving 21.090MHz," Eric said.

With a teleprinter carried home from work on a weekend, successful two-way contact was made between VK3KF and KR6AK.

"I cannot recall the exact date, but it would have been about the end of June 1957," he said.

The exercise was repeated the next weekend, but Eric then explained to Forest that F1 emission was not authorised in Australia. The story may have ended there but for Eric printing out several US RTTY stations a few hours later.

"I felt quite frustrated at not being legally able to go back to them. My work programme also intervened sending me to other parts of Australia and Papua-New Guinea," Eric said.

Due to correspondence with some of the Americans, whose RTTY signals Eric had reported on, a Southern California group shipped a Model 15 teletype, which caused a stir in the Australian Customs Department. After some haggling, a compromise was reached and Eric paid duty on the teletype's motors and spares.

Upon approaching the PMG for permission to use RTTY, F1 emission, a three month trial, on a fixed 21MHz frequency, was granted. But the PMG was reluctant to allow Eric another RTTY permit due to objections from within the amateur ranks.

Eric said the objections were due to the belief that F1 required an excessive band width. Eric, using a newly acquired HP spectrograph analyser, demonstrated to the PMG that the F1 sidebands were considerably narrower than AM.

RTTY was slow to catch on because of equipment shortages. Eventually permits were granted to Bill Storer VK2EG, Chas Noble VK4RQ and ZL3HJ and ZL1WB, in New Zealand.

Oceania was waking up to RTTY and the Americans were scrambling to make contact.

In the early 1960s, the Southern Pacific Radio Teleprinter Society, affiliated to NZART, was formed, with ZL1WB as President and ZK1BS and VK3KF as Vice-Presidents.

In the early and mid 1970s, when permission for RTTY was given by many countries, teleprinters were at a premium, said Eric.

The relatively recent availability of Siemens Model 100 teleprinters had given RTTY in Australia a boost in the arm and resulted in a 'pensioning off' of Model 15 and Creed printers.

Looking to the future, Eric considers RTTY as it was known today would be phased out, probably be the late 1980s, in favour of digital procedures, but he doesn't personally wish to join the computer age.

He also believes the advent of a family of satellites will eventually replace HF RTTY communication and open up a new field for experimentation.

Eric achieved WAC RTTY in 1962, his 100th country on RTTY in October 1971 (his total is now more than 131), and had won many certificates and trophies, in RTTY contests and activities.

This warm, friendly old-timer will see his days out enjoying the clattering of a teleprinter, which is *'music to the ears of the old die hard'* — to quote his own words.

AR

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685MHz — Summer: 7.064MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

RAMBLINGS

With the larger than usual lead-time required for this issue, news items as such would be extremely outdated by the time you read this column. Consequently, I have included in this issue, details of the Japanese Amateur Satellite, JAS-1. This satellite is currently scheduled for launch in February 1986, however, there is some doubt that the launch may go ahead as scheduled.

The launch status will be updated on the AMSAT Australia Net, as news comes to hand.

AMSAT-UK MEMBERSHIP

As a reminder to all subscribers of AMSAT-UK, the yearly donation is now due. For 1986, this is 15 English pounds, and should be forwarded to Ron Broadbent, Honorary Secretary, AMSAT-UK, 94 Herongate Road, Wanstead Park, London, E12 5EQ.

Prospective members should first write to Ron, requesting an application form.

AMSAT-AUSTRALIA NEWSLETTER

The current subscribers to this informative Newsletter now exceed 140. Compiled by Graham VK5AGR, it contains the items of news that you always are in need of, but can never find in the more formal publications. To date there have been a number of small computer programmes written by various satellite communicators for those occasional calculations or routines that are buried deep in a text-book, and you wish to do on the spur of the moment and cannot remember what, where, and how. What's more, they all work, having been tried and tested by Graham, prior to inclusion in the Newsletter.

Each issue has the latest telemetry and message blocks from OSCAR 10, and Bulletin material from OSCARs 9 and 11.

The $15 subscription covers the cost of the Newsletter with the balance being a donation to the Amateur Satellite Programme.

The first donation being contemplated towards the programme will be for Phase-3D, currently under development by AMSAT-DL. This satellite is being 'dubbed' the "super-satellite" as initial plans call for a 250W output downlink transponder. The donation that will be forwarded by AMSAT-Australia will be specifically earmarked for an item of hardware. The more subscribers to the Newsletter will ensure a more sizable donation, for Phase-3D. New subscribers can forward their cheque made payable to the WIA (SA Division) Inc, and forward to Graham VK5AGR, QTHR.

JAS-1 JAPAN'S FIRST AMATEUR SATELLITE is scheduled for February 1986!

Translated and Edited by K Wilkinson ZL2BJR, from JARL News and other JARL material. August 1985. Preliminary copy, subject to change.

BRIEF HISTORY

Launched in 1957, the Russian Sputnik 1 was the first satellite. Sputnik transmitted in the 20MHz band, not far from the 21MHz amateur band, so was heard by many radio amateurs.

The American OSCAR 1, launched in December 1961, was the first radio amateur satellite. It transmitted a beacon and the Morse signal 'HI' in the two metre band, and had a life of about three weeks. OSCAR 3, in 1965, was the first amateur satellite to carry a transponder, making communication via satellite possible.

Though individual Japanese had contributed financially to the OSCAR series, OSCAR 8 was the first satellite to which Japan made a technical contribution — the JAMSAT group, with JARL support, built the 'J' mode transponder and switching regulator. The transponder was a success, and lasted some five years — longer than the design life.

Discussion about a Japanese amateur satellite started in 1980, and the feasibility of using a Japanese H-I rocket to launch such a satellite was considered in 1981. The chairman of the group was then Morimotosan JA1NET, and JA1CO was appointed technical project manager in 1982.

A schedule was produced, and it was decided — because of power supply limitations — to use only J-mode (2m uplink, 435MHz downlink), with both analog and digital transponders.

JA1JHF was selected to manage the transponder project team (which consisted mainly of people who had helped with the OSCAR 8 project), and JA1ANG — the current JAMSAT president, and a member of the AMSAT committee — was asked to help with the digital transponder.

JAS-1 — as the satellite had come to be called — was given the go-ahead in March 1983, and it was proposed to launch it in February 1986 by two-stage H-I rocket (produced by Mitsubishi Heavy Industries). (An H-I is on display in the Japanese government theme pavilion at Expo).

It was decided that the body of the satellite would be built by NEC at their plant in Yokohama, and — to avoid any last-minute problems— two satellites would be built. NEC decided to use a 26-sided polyhedran rather than an octahedran for the satellite body — an aluminium honeycomb sandwich. NASDA (the Japanese National Space Agency) used a model of JAS-1 to test the antenna patterns.

JA1NET was hospitalised, and JA1AD was appointed to act for him.

In 1984, detailed work schedules were produced. Transponders were constructed at JARL during team members' summer vacation, and NEC installed them in the first flight model of the satellite.

In December, JA1NET became a silent key.

Testing of the first satellite was completed in April 1985, and construction of the second was started. Team members finished the second set of transponders in a marathon session during the "golden week" holidays in May.

Transponders

Both analog and digital, J mode (2m uplink, 435MHz downlink). LSB is normally used for the analog uplink, but FM is required for the digital uplink. The downlink is normally USB. Depending on battery condition and schedule (available via JARL telephone service), either analog or digital transponder will be operating. There may be special times scheduled for SSTV, FAX, and RTTY only. Both transponders are only likely to be operated together on weekends.

Analog operation will be limited to "line-of-sight", real-time QSOs, but digital mode will permit bulletin board (store-and- forward) operation. Uplink EIRP required: about 100W. Uplink antenna gain of 10dBi, transmitter power of 10W should be satisfactory. Don't use a higher uplink gain-power product! Downlink (receive) antenna gain of 15dBi should be satisfactory. With such antenna gain figures, the antenna does not need a rotator for the vertical plane — it can be fixed to point 20 degrees above the horizontal.

Analog (JA-mode) Transponder

Uplink 145.900-146.000MHz (LSB or CW). Downlink 435.900-435.800MHz (frequency-inverted to reduce Doppler effect, USB or CW). Don't use FM or AM, or tune up in the satellite passband! First IF is 29.500-29.600MHz. Second IF with 100kHz bandpass crystal filter is on 10.630MHz. On 435.795MHz there will be a CW/PSK beacon (transponder output of 100mW) alternating between a 15- second CW sequence — 'HI' plus a series of three-digit numbers representing telemetry data such as solar cell status, at about 20WPM — and 15 seconds of PSK output at 1200 Baud.

Format of CW Telemetry Data

HI HI 1A 1B 1D
2A 2B 2C 2D
3A 3B 3C 3D
4A 4B 4C 4D
5A 5B 5C 5D

(Note: 1-3 are analog data, 4-5 are status data)

A, B, C, and D are two-digit numbers. Some that may be of interest (divide the two-digit number by 50 to get N):

1A: Solar cell output N (0 to 2A)
1B: Charge rate 2*(N-1)(0 to 2A)
1C: Nicad voltage 11*N (to 20V)
2C: JA Tx O/P 1.1*N.618mW (3W)

Analog Mode Operation

First perform a loop-back test — find a free downlink frequency, and compute the corresponding uplink frequency (581.800-downlink)MHz. Suppose that 435.870MHz is free, then the corresponding uplink frequency is 145.930MHz. (Use headphones with the receiver, to avoid transmitting receiver noise, and to avoid audio feedback). Transmit your call sign, and adjust the transmitter VFO to tune in the received signal (there will be a frequency shift of 2-3kHz due to Doppler effect).

Digital (JD-mode) Transponder

Four uplinks, 145.850/870/890/910MHz (use FM transmitter), AX.25 lev.-2 protocol 1200-bd. NRZI signal transmitted as a Manchester-coded (biphase) signal; downlink is a PSK-coded NRZI 1200-bd. signal on 435.910MHz (use an SSB receiver). A suitable modem circuit is shown in a Japanese-language book on JAS-1. The modulator divides down the (32f) clock of the HDLC controller and gates it with the HDLC NRZI output to create the Manchester-coded signal. The demodulator (developed by JA1TUR for receiving OSCAR-10 telemetry) uses a 565 PLL, D flip-flop and XOR gate. (The Bell 202 FSK modems provided in most TNCs are not suitable). The satellite receiver is a single-conversion superhet with 10.630MHz IF; transmitter output will be about 1W. JD-mode telemetry: 1200 Baud PSK (multiplexed packet output on 435.910MHz).

Digital Transponder Hardware

The CPU module uses a CMOS NSC-800 (Z80 compatible) and 1 M-byte of 256 k-DRAM memory — ten 15cm x 15cm double-sided PC boards, and 327 ICs.

The HDLC module (four receive, one transmit channel) uses another 144 ICs. These modules consume three watts. Tantalum film covers top and bottom surfaces of the ICs, to protect them from radiation. The programme is uploaded from an earth station.

JAS-1 Antennas

There will be three groups of antennas. The 144MHz receive antenna will be a ¼-wave monopole (whip); both the 430MHz digital transmit antenna on the same face and the 430MHz analog antenna on the opposite face use four (¼-wave) antennas in a turnstile configuration, a Wilkinson hybrid (transformer) configuration is used to feed them 90 degrees out of phase — provide a circularly polarised wave — and minimise the effect on the other antennas if any one of the four antennas is damaged.

The solar cells on the satellite surface also act as a ground plane.

OSCAR-10 APOGEES
JANUARY 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st January										
1	1921	1112:14	-25	274	260	25	267	37	277	58
2nd January										
2	1923	1031:16	-25	265	264	34	272	45	285	67
3rd January										
3	1925	0950:19	-25	255	269	42	278	54	301	76
4th January										
4	1927	0909:22	-25	246	275	51	287	63	346	82
5th January										
5	1929	0828:24	-25	237	282	60	301	71	47	79
6th January										
6	1931	0747:27	-25	227	293	69	330	78	71	71
7th January										
7	1933	0706:32	-25	218	315	76	20	78	81	62
8th January										
8	1935	0625:35	-25	208	3	80	54	73	88	53
9th January										
9	1937	0544:37	-26	199	48	76	71	65	93	44
10th January										
10	1939	0503:40	-26	190	69	68	80	56	97	35
11th January										
11	1941	0422:42	-26	180	79	59	87	47	101	26
12th January										
12	1943	0341:48	-26	171	86	51	92	39	105	18
13th January										
13	1945	0300:50	-26	161	92	42	97	30	109	10
13	1946	1440:21	-26	337					247	3
14th January										
14	1947	0219:53	-26	152	96	33	102	22	113	3
14	1948	1359:24	-26	327					251	10
15th January										
15	1949	0138:55	-26	142	101	25	106	14		
15	1950	1318:27	-26	318			245	1	255	18
16th January										
16	1951	0057:58	-26	133	105	17	111	7		
16	1952	1237:29	-26	308	243	-2	250	8	259	26
17th January										
17	1953	0017:03	-26	124	110	9	116	-0		
17	1954	1156:34	-26	299	248	5	254	16	263	35
17	1955	2336:06	-26	114	114	2				
18th January										
18	1956	1115:37	-26	290	252	13	259	24	267	44
19th January										
19	1958	1034:39	-26	280	257	21	263	32	272	53
20th January										
20	1960	0953:42	-26	271	261	29	268	40	278	62
21st January										
21	1962	0912:45	-26	261	265	37	273	49	288	71
22nd January										
22	1964	0831:50	-26	252	270	46	280	58	310	79
23rd January										
23	1966	0750:52	-26	242	276	55	290	66	14	83
24th January										
24	1968	0709:55	-26	233	284	64	308	74	61	76
25th January										
25	1970	0628:58	-26	224	298	72	347	79	77	68
26th January										
26	1972	0548:00	-26	214	328	79	37	77	85	59
27th January										
27	1974	0507:05	-26	205	25	80	63	70	90	50
28th January										
28	1976	0426:08	-26	195	59	73	76	62	95	41
29th January										
29	1978	0345:11	-26	186	74	65	84	53	99	32
30th January										
30	1980	0304:13	-26	177	83	56	90	44	103	23
31st January										
31	1982	0223:16	-26	167	89	47	95	36	107	15
31	1983	1402:47	-26	342					244	-2

Solar Cells
Power output approximately 8.5W. Storage batteries: 11 Nicad cells in series, initial capacity 6Ah

Further Statistics
Satellite: 470mm high, weight 50kg. H-I two-stage rocket: 40m long, 2.4m in diameter; weight 139.1t; capable of carrying a 550kg payload.

Orbit: elliptical, 1500km high; period approximately 1 hour 56 minutes; "window" (over Japan) approximately 20 minutes; 6 passes per day.

A chart will be available to make it easy to calculate the flight path.

de Colin
AR

QSP

AMATEUR HEROICS

Alan Gershbien W4LTA, narrowly escaped death recently, with the help of amateur radio. Whilst walking along a Bahamas beach, Alan stepped on what he thought was a shell, but it was in fact a deadly stonefish. Within a short time, Alan's foot and ankle had swollen to nearly twice normal size, and excruciating pain began shooting up his leg, and he began to have trouble breathing.

Alan instructed his XYL, Nancy, to call for emergency medical assistance on the 14.313MHz Maritime Mobile Net on his new TS430S. Although Nancy is not an amateur, she knew that the frequency was programmed into one of the memory channels, and succeeded in calling up the frequency on the VFO.

Nancy contacted the Net Control Operator, Randy Maurer WA3HLP, and was able to get the necessary information from the Tampa Poison Control Centre for almost immediate relief to Alan's discomfort.

From 73 for Radio Amateurs — August 1985

BILL THE MECHANIC

Ted Holmes VK3DEH
20 Edmunds Street, Parkdale, Vic. 3195

If there was one thing Bill Blitheringtwit knew he was good at, that was anything mechanical. He had to admit that stupid things like transistors made about as much sense to him as Sanscrit. As for chips, he had nothing but contempt for them. Idiotic things! How was a chap expected to do anything with them? You only had to look at them and the blessed things gave up. Then you could never find out what was wrong with them.

The trouble was that there was nothing you could see. It was all locked away in that silly little plastic rectangle with the pathetic thin legs which broke at the slightest touch. No, transistors, chips and their ilk were definitely not for him. But things mechanical — that was different. You could see what you were working on and, better still, if all else failed, you could always give it a good swipe with a hammer or even kick it. It was surprising how many things responded to a swift boot in the ribs.

Take the Holden. He'd fixed that quite well, when the brakes had packed up and the rear wheel fell off. He'd almost won his argument at the local garage but the boss had intervened and been most objectionable. Bill had afterwards decided to have the roadworthy test done somewhere else.

All this he concluded to himself, as he knelt on the floor and peered into the bowels of his Model 100, into which he had recently dropped a screwdriver. Strange thing was he couldn't see the screwdriver anywhere. It was as though the machine had eaten it. It was a bit heavy to pick up and turn upside down, but he might as well try it.

Puffing a little, he hauled the unit up from the floor and inverted it. As though by signal the carriage immediately came of and fell on his foot. Bill yelped with pain and jumped. He found himself hopping around in his shack on one foot and still hanging on to what was left of the Model 100. Still no screwdriver appeared. Better take the cover off and have a look.

He set the machine down and rummaged around for another screwdriver. To his amazement he managed to drop this into the machine, where it presumably joined its companion. Bill couldn't believe it. If things went on like this, pretty soon he would run out of screwdrivers! Again he searched around and came up with an old Army type and he attacked the case with this. Finally he got it off and revealed the innards of the machine, which looked at this stage somewhat forlorn.

By now Bill was a bit sick of RTTY and all it stood for. So he pushed the machine under a desk to gather dust. The two screwdrivers lay on the carpet, hidden by assorted rubbish, where they remained undetected for a considerable time.

AR

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

JANUARY

1	*UBA SWL Competition 1986 (Rules October AR)*
6	*Ross Hull Memorial VHF Contest concludes*
11	*40 metre World SSB Championship Contest**
11-12	*Michigan QRP Club CW Contest*
12	*75 metre World SSB Championship Contest**
18-19	*Hungarian DX Contest (Rules this issue)*
18-19	*White Rose SWL Contest (Rules December AR)*
16-19	*160 metre World SSB Championship Contest**
24-26	*CO WW 160 metre CW Contest*
25	*15 metre World SSB Championship Contest**
26	*20 metre World SSB Championship Contest**

FEBRUARY

1- 2	*RSGB 7MHz SSB Contest (Rules this issue)*
15-16	*1986 ARRL International DX Contest — CW Weekend (Rules this issue)*
22-23	*RSGB 7MHz CW Contest*
21-23	*CO WW 160 metre SSB Contest (Rules this issue)*

MARCH

1- 2	*1986 ARRL International DX Contest — SSB Weekend (Rules this issue)*
8- 9	*Commonwealth Contest 1986 (Rules this issue)*
8- 9	*QCWA Phone QSO Party*
15-16	*John Moyle Memorial Field Day Contest*
15-16	*YL-ISSB CW QSO Party*
29-30	*CQ WW WPX SSB Contest*

** Denotes World SSB Championship Contests sponsored by 73 magazine. Rules for these contests appeared in December AR.*

Members may note that the CW Contest no longer appears in the Contest Calendar. I have been advised by the Federal Office that the matter of this contest has been discussed and it has been agreed that it should not continue. However, it has also been decided that, to encourage our members to utilise the CW mode, the President's Cup will be awarded on the basis of the top scorer, on CW, in the John Moyle Memorial Field Day Contest. Full details regarding this new approach, which was suggested as a compromise by Wally Watkins VK2DEW, Alternate Federal Councillor for the New South Wales Division, will be provided in the rules for that contest, which will appear in February magazine.

I would like to begin this New Year by wishing you, one and all, a very happy New Year, and also that it will be one of great success for you in all of your activities. I also trust that it will be a year of co-operation and achievement within our ranks, throughout the world.

BUSY — BUSY

I would like to point out that these notes are being compiled in the wee small hours, early in November, so they may make the deadline for January. Unfortunately, I will not be able to provide the results of the 1985 Remembrance Day Contest in this issue, as I had hoped, due mainly to the fact that I have received only about 19 hours notice of having to leave for a visit to the USA, and consequently, as the duration of the trip will exceed two weeks, this does not provide me with enough time to finalise the results. I am hopeful of providing the results for both the RD and the VK Novice Contests in February magazine.

BACKLOG OF CERTIFICATES

I am pleased to be able to report that the backlog of Contest Certificates, up to the end of 1984, have been completed, and are about to be forwarded to the Federal Office for distribution. Hopefully, by the time you read this column, you will have received your wayward certificate.

It now only remains to have the certificates made out for the 1986 Field Day Contest, which will bring matters right up-to- date. I will then be making immediate arrangements for the Remembrance Day and VK Novice Contest certificates for 1985, to be completed after my return from overseas. I am most grateful to the Federal Secretary/Manager, Mr Reg Macey, for his kind offer to relieve me from the large workload of addressing, and mailing the extremely large number of certificates involved.

CONTEST RULES

Included in the contest rules published in this issue are a set of rules to be used as '**guidelines only**' for the 1986 ARRL International DX Contest. I have not received any copy of such rules from the ARRL, however, I am aware that the rules for this contest generally vary little from year to year. I have thus taken a copy of the rules as published for 1985 and modified them in the light of what you could expect. Hence, my warning, ***they are for guidance only.***

The results for the 1985 Hungarian DX Contest have only recently been received. These results indicate very little interest by VK amateurs in this contest. I will provide the rules for this contest, albeit rather belatedly, so as to allow you a chance to try it this year. If there appears to be sufficient interest aroused, I would intend to include it in future years, otherwise I may as well ignore it altogether.

As I have previously pointed out there are certainly too many contests, by far, although just what can be done about it at this stage, I am not sure. Maybe, as out national organisation is the oldest of it kind in the world, it could put its years of experience to use and become a leading body through the IARU in the cause to have some rational modifications made to the international scene. *Will you perhaps encourage your Division to vote for such a proposal at the next Convention?*

1986 ARRL INTERNATIONAL DX CONTEST

To the serious DX contestant and the casual county hunter alike, the third full weekend in February (15-16 for CW) and the first full weekend in March (1-2 for phone) bring the challenge and excitement of the ARRL International DX Contest. For these two weekends each year, the bands spring to life with DX aplenty. An operator can choose to go all out in the competition for a top score, or leisurely chase those last few countries needed to finish the requirements for the five-band DXCC award.

If you participated in the 1985 ARRL International DX Contest, you are that much ahead of the rest.

Use of the official entry forms makes the post-contest paper-work easier for you, and makes the job of compiling the results a breeze. To receive a set of entry forms, send a SAE (business sized) and two IRCs to ARRL Headquarters.

Complete contest rules are listed below. Any questions resulting from these rules should be directed to ARRL Headquarters.

RULES

Amateurs world-wide are eligible.

Amateurs to work as many W/VE stations in as many states and provinces, as possible.

CW — to be held on 15-16th February

PHONE — to be held on 1st-2nd March

The contest is for 48 hours duration each mode (separate contests). Starts 0000 UTC Saturday; ends 2400 UTC Sunday.

Categories:

Single Operator — One person performs all operating and logging functions. Use of spotting nets (operator arrangements involving assistance through DX-alerting nets, etc) is not permitted. Single-operator stations are allowed only one transmitted signal at any given time.

1 All band.

2 Single band (one only). Single-band entrants who make contacts on other bands should submit logs for checking purposes.

Multi-operator — More than one person operates, checks for duplicates, keeps the log, etc.

1 Single transmitter. One transmitted signal at any given time. Once the station has begun operation on a given band, it must remain on that band for at least 10 minutes; listening time counts as operating time. Multi-operator, single-transmitter stations must keep a single, chronological log for the entire contest period. Violation of the 10-minute rule or improper logging will result in an entrant's reclassification to the unlimited multi-multi class.

2 Two transmitters. A maximum of two transmitted signals at any given time, on different bands. Once either station has begun operation on a given band, it must remain on that band for at least 10 minutes; listening time counts as operating time. Both transmitters may work any and all stations; the second transmitter is not limited to working new multipliers only. Each of the two transmitters must keep a separate chronological log for the entire contest period. Violation of the 10-minute rule by either or both transmitters or improper logging will result in an entrant's reclassification to the unlimited multi-multi class.

3 Unlimited. A maximum of one transmitted signal per band at any given time. Unlimited multi-multi stations must keep a separate, chronological log for each band for the entire contest period.

QRP — Single operator, all band only. QRP is defined as 10W input or less (or five watts output or less).

Contest Exchange: Stations send a signal report and power (three-digit number indicating approximate transmitter input power).

Scoring: Count three points per W/VE QSO. Multipliers are the sum of US states (except KH6/KL7) and District of Columbia (DC), VE1-7, VO, VE8/VY1, worked per band. Maximum of 58 per band. The final score is QSO points X multiplier = final score.

Miscellaneous — Call signs and exchange information must be received and logged by each station for a complete QSO.

All operators must observe the limitations of their operators license at all times.

Your call sign must indicate your DXCC country station location (KH6XYZ/W1 in Maine; FG0AAA/FS on St Martin, etc).

One operator may not use more than one call sign from any given location during the contest period.

The same station may be worked only once per band — no cross mode, cross band, or repeater contacts.

Aeronautical and maritime mobile stations outside the US and Canada may not be worked for QSO or multiplier credits by W/VE stations.

All transmitters and receivers must be located within a 500 metre diameter circle, excluding directly connected antennas. This prohibits the use of remote receiving installations. Exception: Multi-operator stations may use spotting nets for multiplier hunting only.

Reporting — Logs must indicate times in UTC, bands, calls, and complete exchanges. Multipliers should be clearly marked in the log the first time worked. Entries with more than 500 QSOs total must include cross-check sheets (dupe sheets).

All operators of multi-operator stations must be listed.

Entries must be post-marked within 30 days of the last contest weekend (1st April 1986). Logs not postmarked by the deadline will be classified as check logs; no extensions, no exceptions. All stations are requested to send their entries in as early as possible. Entries received after mid-July will not make QST listings.

Plaques will be awarded in both the CW and Phone contests to the top scorer in the single operator-all band category world- wide and on each continent. In addition, world-wide leaders in

the single operator-single band, QRP, multi-operator-single transmitter, multi-operator-two transmitters and multi-operator unlimited categories will receive plaques.

Additional plaques will be awarded as sponsored.

Certificates will be awarded on a similar basis.

Conditions of Entry — General contest 'fair play' and disqualification criteria apply. If a contestant is disqualified, that operator will be barred from entering the contest on that mode the following year, and the calls of all disqualified entrants will be listed in QST with the contest results.

RSGB 7MHz SSB & CW CONTESTS 1986

All licenced amateurs are eligible to enter this contest.

TIMES — SSB: from 1200 UTC 1st February till 0900 UTC 2nd February 1986.

— CW: from 1200 UTC 22nd February till 0900 UTC 23rd February 1986.

BANDS — SSB: 7.040-7.100MHz; CW: 7.000-7.030MHz.

EXCHANGE — RS(T) plus serial number commencing at 001. When received, serial numbers from non-competing stations must be recorded.

SCORING — Non-European stations with British Isles stations 15 points per QSO. Note: *contacts with aeronautical and maritime mobile stations will count five points per QSO, but not for multipliers.*

MULTIPLIERS — Multipliers may be claimed for each British Isles prefix worked: G0, G2, G3, G4, G5, G6, G8, GD0, GD2, GD3, GD4, GD5, GD6, GD8, GI0, GI2, GI3, GI4, GI5, GI6, GI8, GJ0, GJ2, GJ3, GJ4, GJ5, GJ6, GJ8, GM0, GM2, GM3, GM4, GM5, GM6, GM8, GU0, GU2, GU3, GU4, GU5, GU6, GU8, GW0, GW2, GW3, GW4, GW5, GW6, GW8. In all a maximum of 49 can be claimed. Note the prefix GB cannot be claimed as a multiplier.

FINAL SCORE — OSO points multiplied by the number of multipliers claimed.

Logs — Log sheets should be headed date; time (UTC); call sign of station worked; RS(T) and serial number sent; RS(T) and serial number received; multiplier if claimed and QSO points. A separate sheet showing countries or prefixes claimed is also required. Unmarked duplicate contacts for which points have been claimed will be heavily penalised and logs containing more than five will normally be disqualified.

DECLARATION — Each log must be accompanied by the declaration: *"I declare that my station was operated in accordance with the rules of the contest and in accordance with my license."* The declaration must be signed and dated.

ENTRIES TO BE SENT TO — PO Box 73, Lichfield, West Midlands, WS13 6UJ, England.

CLOSING DATE — SSB logs must be received by 31st March 1986. CW logs by 20th April 1986.

RECEIVING SECTION

Rules for the receiving section are the same as for above except where stated below.

SCORING — Listeners should log only British Isles stations operating in the contest, and claim 15 points per QSO logged.

MULTIPLIERS — Are the same as for the transmitting section.

LOGS — Logs should be headed date; time (UTC); call sign of station heard; call station of the station being worked; report sent by station heard; multiplier if claimed and points. Note that in the column 'station worked' the same call sign may only appear once in every **three** contacts logged unless it is a new multiplier.

RSGB COMMONWEALTH CONTEST 1986

Date of Contest From 1200 UTC on Saturday 8th March to 1200 UTC Sunday 9th March 1986.

Eligible Entrants All amateur operators licensed to operate within the British Commonwealth or British Mandated Territories. Entries from GB, aeronautical or maritime mobile will not be accepted.

Contacts A1A only in the 3.5, 7, 14, 21, and 28MHz bands. Contacts may be made with any station using a British Commonwealth call sign except those within the entrant's own call area. All entrants are requested to confine their operation to within the lower 30kHz of each band except when contacting novice stations that operate above 21.100 and 28.100MHz. A contact exchange consists of RST and serial number commencing at 001. Serial numbers from non-competing stations, when sent, must be recorded.

Scoring Each completed contact will score five pints. In addition, a bonus of 20 points may be claimed for the first, second, and third contact with each Commonwealth call area. All British Isles prefixes (G, GB, GD, GI, GJ, GM, GU, and GW) count as one call area.

Logs A separate log for each band must be submitted and to include UTC, call sign of station worked, RS(T)/serial number sent, RS(T)/serial number received and points claimed. Band totals must be added together and submitted on a separate cover sheet. Duplicate contacts must be clearly marked without claim for points. Any unmarked duplicate contacts for which points have been claimed will be heavily penalised, and logs containing in excess of five will normally be disqualified.

Entries Entries may be single or multi-band. Single band entries may show, on separate sheets, contacts made on other bands for checking purposes only. Each entry should consist of the separate bands logs, together with a cover sheet declaration stating that the rules have been observed.

Address for Logs Logs should be sent AIRMAIL to A K Gray G4DJX, 44 Sherwood Avenue, St Albans, Herts, AL4 9PQ, England. Adjudication commences on 14th April and any entries received after this date may not be accepted.

Awards The winner will receive the BERU Senior Rose Bowl, and the runner-up the BERU Junior Rose Bowl. Certificates of merit will be awarded to the first, second, and third placings.

Receiving Section Dates and times as above. Only the entrant may operate his/her receiving station for the contest. Holders of a transmitting license for frequencies below 30MHz are not eligible to enter.

Scoring To count for points, a station outside the entrants own call area must be heard in a contest contact. CO or test calls will not count for points. A station may be logged only once on each band to count for points. When both stations are heard they should be logged separately and points claimed for both entries, provided they are both outside the entrant's own call area. Each completed entry shall score five points. In addition, a bonus of 20 points may be claimed for the first, second, and third station heard in each British Commonwealth call area. British Isles prefixes count as one call area.

Logs A separate log is required for each band. Logs should how time/UTC, call sign of station heard, RS(T)/serial number sent by station heard, call sign of station worked and points claimed.

Entries Each entry should consist of logs for each band, a cover sheet and a signed declaration stating that the receiving station was operated within the rules and spirit of the contest and that the entrant does not hold a transmitting license for frequencies below 30MHz.

Address for Logs As above.

Awards The BERU Receiving Rose Bowl to the winner. Certificates of merit to the leading entrant in each continent.

COMMONWEALTH CALL AREAS The following call areas are recognised for the purposes of scoring in the 1986 Commonwealth Contest.

A2	*Botswana*
A3	*Tonga Is*
C2	*Nauru*
C5	*Gambia*
C6	*Bahamas*
G/GB/GD/GI/GJ/GM/GU/GW	
H4	*Solomon Is*
J3	*Grenada*
J6	*St Lucia*
J7	*Dominica*
J8	*St Vincent*
P2	*Papua New Guinea*
S7	*Seychelles*
T2	*Tuvalu*
T30	*W.Kiribati*
T31	*C Kiribati*
T32	*E Kiribati*
V2	*Antigua, Barbuda*
V3	*Belize*
VE1	*Maritime Provinces*
VE1	*Sable Is*
VE1	*St Paul Is*
VE2	*Quebec*
VE3	*Ontario*
VE4	*Manitoba*
VE5	*Saskatchwean*
VE6	*Alberta*
VE7	*British Columbia*
VE8	*North West Territories*
VK1	*Australian Capital Terr*
VK2	*New South Wales*
VK3	*Victoria*
VK4	*Queensland*
VK5	*South Australia*
VK6	*Western Australia*
VK7	*Tasmania*
VK8	*Northern Territory*
VK9L	*Lord Howe Is*
VK9N	*Norfolk Is*
VK9X	*Christmas Is*
VK9Y	*Cocos Keeling Is*
VK9Z	*Mellish Reef*
VK0	*Heard Is*
VK0	*Macquarie Is*
VK0/VP8/	
ZL5	*Antarctica*
VO1	*Newfoundland*
VO2	*Labrador*
VP2E	*Anguilla*
VP2K	*St Kitts, Nevis*
VP2M	*Montserrat*
VP2V	*British Virgin Is*
VP5	*Turks & Caicos Is*
VP8	*Falkland Is*
VP8	*S Georgia*
VP8	*S Orkneys*
VP8	*S Sandwich Is*
VP8	*S Shetland Is*
VP9	*Bermuda*
VQ9	*Chagos*
VR6	*Pitcairn*
VS5	*Brunei*
VS6	*Hong Kong*
VY1	*Yukon*
VU	*India*
VU	*Laccadive Is*
VU7	*Anadaman & Nicoba Is*
YJ	*Vanuatu*
Z2	*Zimbabwe*
ZB2	*Gibraltar*
ZC4	*Cyprus (UK Bases)*
ZD7	*St Helena*
ZD8	*Ascension Is*
ZD9	*Tristan da Cunha, Gough Is*
ZF	*Cayman Is*
ZK1	*Cook Is*
ZK1	*Manihiki*
ZK2	*Niue*
ZK3	*Tokelau*
ZL0	*
ZL1	*
ZL2	*
ZL3	*
ZL4	*
ZL7	*Chatham Is*
ZL8	*Kermadec Is*
ZL9	*Auckland & Campbell Is*
3B6/3B7	*Agalega & St Brandon*
3B8	*Maurilius*
3B9	*Rodriguez Is*
3D2	*Fiji*
3D6	*Swaziland*
4S	*Sri Lanka*
5B4	*Cyprus*
5H	*Tanzania*
5N	*Nigeria*
5W	*West Samoa*
5X	*Uganda*
5Z	*Kenya*
6Y	*Jamaica*
7P	*Lesotho*
7Q	*Malawi*
8P	*Barbados*
8Q	*Maldives*
8R	*Guyana*
9G	*Ghana*
9H	*Malta*
9J	*Zambia*
9L	*Sierra Leone*
9M2	*W Malaysia*
9M6/8	*E Malaysia*
9V	*Singapore*
9Y	*Trinidad & Tobago*

* Due to recent changes in the New Zealand licence allocations, ZL0, ZL1, ZL2, ZL3, and ZL4 will count as separate call areas for the purpose of this contest.

HUNGARIAN DX CONTEST

This contest is held on the third full weekend of January each year. This year it will be held from 2200 UTC Saturday 18th January to 2200 UTC, Sunday 19th January.

The contests aims are to strengthen traditional radio amateur friendships, to prove technical and operating abilities and knowledge and to help participants to fulfill the conditions for various Hungarian diplomas. It is organised by the Hungarian Radio Amateur Society.

Categories

Single operator, single band

Single operator, multi band

Multi operator, multi band (Club stations are only permitted to enter this section)

Frequencies 3.5, 7, 14, 21, and 28MHz. Only one signal, on one band permitted at any time. This rule shall be strictly enforced. Disregarding this rule results in disqualification.

Mode CW only

Call CQ HA Test

Exchange Signal report and progressive serial number from 001. Hungarian stations will give an additional two-letter code/county as follows:

HA, HG1 — GY, VA, ZA; HA, HG2 — KO, VE; HA, HG3 — SO, TO, BA; HA, HG4 — FE; HA, HG5 — BP; HA, HG6 — NO, HE; HA, HG7 — PE, SZ; HA, HG8 — BN, BE, CS; HA, HG9 — BO; HA, HG0 — HA, SA.

Score HA, HG stations — 6 points; DX stations — 3 points; Own Continent — 0 points

Multipliers Number of Hungarian counties, per band.

Total Score Sum of points multiplied by the sum of the total multipliers.

Logs Separate logs per band, plus a summary sheet with a signed declaration should be sent to the Contest Bureau, H- 1581 Budapest, Box 86, Hungary, within six weeks of the contest.

AWARDS The top three entrants in each country, continent and category will be awarded certificates. The absolute winners of the categories SOMB and MOMB will also receive a plaque. The winner of the SOSB category will receive an memorial award.

Diplomas Foreign participants may also apply for the following awards: WHD, Savaria, Pannonia, Dunakanyar/DD, Balaton/BD, Budapest/BPA.

Worked Hungarian Districts (WHD) Applicants must confirm two-way QSOs with at least five different districts. Fee: 5 IRCs.

Savaria Work 10 different HA/HG1 stations. Fee: 10 IRCs.

Pannonia The applicant must submit proof of 3-3 QSOs with HA/HG1,2,3,4 stations on more than one band. Fee: 10 IRCs.

Dunakanyar The applicant must confirm 5 HA/HG7 QSOs. Fee: 10 IRCs.
Balaton The applicant requires 15 points, and must work at least one club member. Club members count as five points and are HA3GJ, KGJ, KHL, GI, GQ, HE, HL, HQ, HZ, IG, IK, IQ, IS, NG, 4XW, 6NP, and 8UA.

The following stations count as three points: HA1KXX, XA, XX, ZY, 2RQ, KRQ, KSC, YRC, SH, Y, 3KHB, KHO, GG, GO, HK, HO, and HU.

The following stations count as one point: HA1KRA-KRZ, KXA-KXZ, KZA-KZZ, RA-RZ, XA-XZ, ZA-ZZ, DRA-DZZ. HA2KPA-KTZ, PA-TZ, ENA-EZZ. HA3KGA-KIZ, GA-IZ, FLA-FSZ. Fee: 10 IRCs

Budapest Award Requirements — 25 different HA/HG5 stations. Fee: 10 IRCs.

EDITOR'S NOTE — Recently, references have been made by another magazine about the lack of rules for the VK/ZL/Oceania Contest. All contesting members are aware that this contest is separate from the Federal Contest Manager's duties, and any queries about this contest should be directed to the VK/ZL/O Contest Manager, not the WIA Federal Contest Manager.

AR

QSP

WORLD'S LARGEST, FASTEST COMPUTER

The National Aeronautics and Space Administration (NASA) has unveiled what it says is the world's most powerful, and fastest, computer.

The unit is about half the size of a car, and capable of performing 250 million calculations per second.

The computer, which is being installed at the NASA Ames Research Centre, south of San Francisco, will be used primarily for aircraft and spacecraft design.

Built by Cray Research Inc, one of the worlds few companies making super-computers, the Cray-2 can handle 256 million word problems, 16 times more than those handled by previous super-computers.

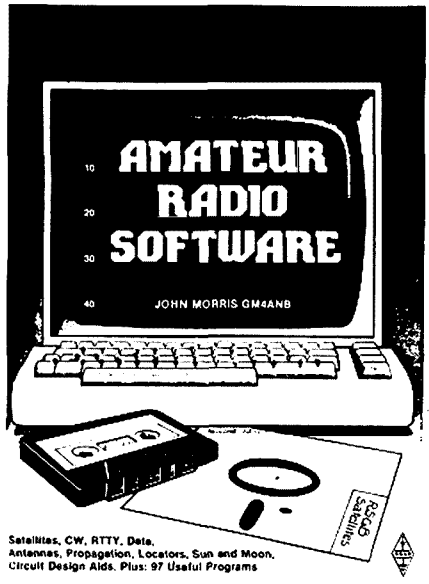
Scientists say the Cray-2 was the first element of a large computer system being assembled by NASA.

Once completed by late 1987, it is believed the computer will be able to perform one billion computations per second.

Book Review

AMATEUR RADIO SOFTWARE

Evan Jarman VK3ANI
TECHNICAL EDITOR



It seems that the home computer has achieved complete penetration of the amateur shacks. However, it suffers from one problem; without software (programs) it is useless. Having acquired a computer and grown tired of playing games and letter writing, what can you do? For radio amateurs, this book provides an answer.

AMATEUR RADIO SOFTWARE has two purposes. Firstly, it is a source book of programs. They are ready to roll, all they need in loading into the computer. Having tried a couple of the programs, I wanted them all 'on disk' just in case. The only limitation to this is that it will take a lot of typing. There are 97 programs, in all. Most are written in Basic language, which is almost the universal programming form for home computers, However, six of the programs are written in assembly language. These are the 'on air' or 'real time' programs.

Assembler is restricted to Morse code and radio teletype operation and caters for the 6502, Z80 and 6800 chips. The subtleties of various forms of Basic are discussed.

Secondly, AMATEUR RADIO SOFTWARE is a source-book of ideas. The various concepts in each field are discussed and protocols developed for handling them.

While limiting themselves to the programs listed, the author shows how the algorithm is developed. It is as a source of ideas that this book excels: for those who want to develop their own programs by seeing how others have tackled the problems one inevitably encounters.

Subjects discussed (and programs) are CW, RTTY (including AMTOR), Data, Antennas, Propagation, Great Circle Distances and Bearings, Satellites (including the sun and the moon), Circuit Design, and the Ubiquitous list (logs, etc).

It is the best book available at the moment, and sets a standard for others. The attention-to-detail is very good, but there is the occasional miss. The HF propagation program is not well described, and is a modified version of mini MUE consequently it is not completely original. This is the only weakness found in a generally excellent publication.

If you are interested in software specifically for use in amateur radio, or are only seeking ideas on how to write your own, AMATEUR RADIO SOFTWARE, by John Morris GM4ANB and published by the RSGB 1985, is well worth acquiring. It will be available at your Divisional Bookshop during February.

AR

The world's coldest temperature was reportedly recorded on 14th January 1734, in Yeneseisk, Siberia. The temperature plummeted to 120 degrees Fahrenheit, below zero.
Courtesy Angela Laurence.

KENWOOD

AUSTRALIA'S FIRST 70W 2M FM MOBILE TRANSCEIVER

AVAILABLE FEBRUARY 1986 ORDERS BEING TAKEN NOW!

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The KENWOOD TM-2550A/TM-2570A 2M FM Mobile Transceivers have been designed to satisfy the needs of the most demanding 2m mobile operator.
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An optional MU-1 DCL (Digital Channel Link) unit provides a revolutionary new signalling capability, giving the operator maximum flexibility and efficiency in his normal, day-to-day contacts, or in high speed net operations.

FEATURES

* Optional MU-1 DCL "Digital Channel Link System" Unit
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Width mm (inch)	180 (7.09)
Height mm (inch)	60 (2.36)
Depth mm (inch)	250 (9.84)
Weight kg (lbs)	2.35 (5.18)

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AR86

Awards

Joe Ackerman, VK4AIX
5 Koomooloo Court, Mermaid Waters, Qld 4218

The following notes are the last contribution from Joe VK4AIX, because, as of the first of this month, Ken Hall VK5AKH is the new Federal Awards Manager.

Thanks Joe, for your contributions for the past 12 months. — Ed

UNITED NATIONS AT FORTY AWARD

On 24th October 1985, the United Nations celebrated the 40th Anniversary of the coming into force of the United Nations Charter, signed at San Francisco in 1945.

To celebrate the event, and in the spirit of developing friendly relations among nations, the United Nations Staff Recreation Council Amateur Radio Club sponsored the UN AT 40 AWARD.

This award is available to any amateur radio station or SWL (on a heard basis), that contacted two of the three amateur stations operating with the United Nations prefix from 1st January to 31st December 1985. Contacts could have been made on any band or any mode.

The three stations are:

4U1UN at the UN Headquarters, New York.
4U1ITU at the International Telecommunication Headquarters, Geneva.
4U1VIC at the Vienna International Centre, Austria.

Applicants must send a list of the stations worked including — Date; Time; Mode; Report; and Band. This list must contain a signed *statement* declaring the bona fides of the application. The cost of the Award is US$5 or 15 IRCs, of which US$4 will be donated to UNICEF

The application must be forwarded, before 1st February 1986, to: *United Nations Staff Recreation Council, Amateur Radio Club, United Nations Room DC1-0724, Box 20, New York, NY 10017.*

Award No 1 — W6AM; Award No 2 — W2JGR; Award No 3 — W6ISQ.

NEW DX-PEDITION AWARD

The Clipperton DX CLub has originated an interesting new award to encourage stations to work DXpeditions.

Valid contacts are from 1st January 1984.

An expedition is defined for the certificate as a station active less than three months (in other words temporary) from one location and who is a valid operation. The territory of the operation constitutes a distinct geographic location and doesn't need to be a distinct DXCC country.

Three classes of awards are available for total points.

Class 3 — 100 points
Class 2 — 250 (CDXC Excellence)
Class 1 — 500 (Honour Roll)

You receive one point on each band and mode. The same expedition worked on both modes gives one additional point. Also you must work expeditions on five continents minimum. Valid bands are 10; 15; 20; 40; 80; and 160 metres.

Detailed rules can be obtained by sending two IRCs to F6EYS, QTHR, with an SAE.

MAJOR MITCHELL AWARD

The Swan Hill District Radio Club is sponsoring an award to coincide with the 150th Anniversary of Swan Hill.

The Award will be known as THE MAJOR MITCHELL AWARD, and is available on a world-wide basis to all amateurs and SWLs.

Australian stations require three two-way contacts with members of the Swan Hill District Radio Club. One QSO is to be with the Club Station VK3BSH.

Overseas stations require two contacts with club members or one contact with the Club Station, VK3BSH.

All bands and modes, but no cross bands or modes will be permitted.

Contacts made through the Club Repeater, VK3RSH, will qualify.

Period of availability will be from 1st January to 31st December 1986.

No QSLs are required. Applications will be checked against members station logs.

Available to SWLs for accurate reports on transmissions heard. Reports from within VK and DX listeners follow the same rules as for transmitting stations.

Cost of the Award is $A2 within Australia, and $A3 or equivalent, for overseas.

Applicants to be sent to: *The Awards Manager, SHDRC, PO Box 682, Swan Hill, Vic. 3585.*

To assist amateurs and SWLs to obtain this award, a Club Net will commence on Tuesday, 4th February 1986, at 1000UTC on 3.565MHz ±. Bon chance!

DEUTSCHER AMATEUR RADIO CLUB AWARDS

These diplomas can be obtained by licensed radio amateurs and SWLs world-wide. All contacts must be made from the same country.

Awards for club stations will be issued to the club and not to an individual operator. The DARC DX AWARDS are based on the 'European Country List' and the 'ARRL DXCC List'. All amateur bands, for which the applicant holds a valid license may be used. A set application form for the awards is available for three IRCs at the address below. The use of the official forms is obligatory.

QSL cards for all contacts must be submitted with the application. Any altering or forging will result in disqualification. The service charge is 10 IRCs, 10.-DM or US$5 per award. The costs for each endorsement is 5 IRCs, 5.-DM or US$3.

All applications to: *DARC DX Awards, Walter Geyrhalter DL3RK, Box 1328, D-8950 Kaufbeuren, West Germany.*

New award holders will be published in cq-DL, the club magazine of DARC.

European Country List

C31; CT1; DL; EA; EA6; EI; F; FC; FC; G; GD; GI; GJ; GM Shetland; GU; GW; HA; HB; HB0; HV; I; IS; IT; JW Bear; JW Spitsbergen; JX; LA; LX; LZ; OE; OH; OH0; OJ0; OK; ON; OY; OZ; PA; SM; SP; SV; SV5 Rhodes; SV9 Crete; SV Athos; T77/M1; TA European part; TF; UA1346; UA2; UA Franz Josefs Land; UB; UC; UN/UK1N; UO; UP; UQ; UR; Y22-99/DM; YO; YU; ZA; ZB2; 1A0;3A; 4U1 Geneva; 4U1 Vienna; 9H1.

WAE (Worked all Europe)

A certificate awarded to amateur radio stations for contacts with European countries on different bands.

The WAE is issued in two divisions Telegraphy (2 x CW) and Telephony (2 x SSB/AM/FM). Each European country counts as one point on each band. For stations outside Europe contacts on 80 and 160m bands count as two points. Maximum five bands per country can be used.

WAE III at least 40 countries and 100 points
WAE II at least 50 countries and 150 points
WAE I at least 55 countries and 175 points

Holders of WAE I get a special WAE badge.

EU-DX-D (Europa-DX Diplom)

The EU-DX-D is an award that may be claimed annually. The EU-DX-D is issued in the following classes: Telegraphy - 2 x SSB - mixed modes. For the mixed class, at least 30 percent of the contacts must be made in a different mode.

A minimum of 50 points is required for the EU-DX-D per year. 20 points must be obtained by contacts with European countries and 30 points by contacts with countries outside Europe. All bands can be used. Each country counts as one point, on 80 and 160m they count as two points. Stickers are available for each additional block of four European and six non-European points within the same calendar year.

The EU-DX-D may be claimed every year anew. Each year's score may be added to obtain the EU-DX-D 500 badge and the EU-DX-D 1000 trophy. There is no limit to the number of years.

Europa Diplom

The Europa Diplom is awarded for working, or hearing amateurs in European countries. Applicants must prove a total score of at least 100 points.

ANNUAL SCORE: Each confirmed European country counts one point per year on each band.

TOTAL SCORE: Sum of the annual score for the year of application and the five preceding years. There is no more devaluation.

Europa Diplom Honour Roll

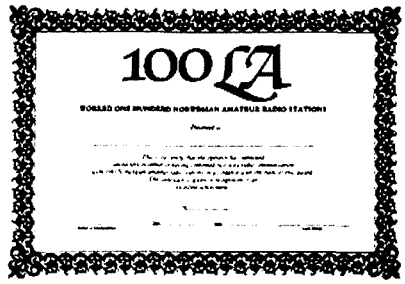
Each certificate holder with an actual score of at least 300 points will be listed in the Europa Diplom Honour Roll.

The Honour Roll will be published twice a year in cq-DL.

To improve the score, QSL cards may be submitted twice a year. Make sure that the award manager receives them before 30th June or 31st December of each year, to be considered in the subsequent publication.

Europa 300 Trophy

Owners of the Europa Diplom my obtain the Europa 300 Trophy. Applicants must prove to have 300 country points when counting each country, on each band only once in all the years. Serving charge is 20.-DM or US$10 for the trophy when applied for with the Europa Diplom.



100 LA

This award is issued by the Stavanger Group of the Norwegian Radio Relay League, who offer a cup in all three modes as a prize to the first applicants (licensed amateurs and SWLs on a heard basis) to obtain the requirements for the award.

Stations require 100 two-way radio contacts with different LA/LB stations, on or after 1st January 1984. LF, LJ, and LH stations do not count for this award.

All valid amateur bands can be used, however 10, 18, and 24MHz are not valid before 1st January 1989.

The award is issued for CW, phone, or mixed modes.

A list showing full details of the contacts, confirmed by QSL cards, should be certified by the Award Manager of the national society.

The fee for the award is 20 NOK or 10 IRCs.

The application must contain call sign; date; band; RST; and modes and be addressed to: *The Awards Manager, Stavangergruppen av NRRL, Postboks 354, 4001 Stavanger, Norway.*

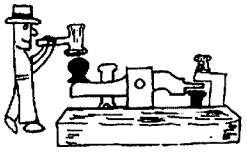
AR

JUBILEE 150 AWARD

VK5 amateurs will run nets on most frequencies to enable interstate amateurs to gain contacts for the J150 Award.

The main net will be on 3.586MHz on Sundays, Tuesdays, and Fridays, starting at 1000UTC. The first of these nets will commence on Sunday, 5th January, at 1000UTC.

John VK5SJ, is in charge of 'operations' and will provide further details and frequencies in next months issue of Amateur Radio. AR



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

KEYS AND KEYERS (Part 1)

A request from a reader, coupled with an advertisement in a Japanese amateur publication, has prompted this reprise on the subject of keys and keyers. The advertisement featured a new key from Hy-mound, called 'the swallow'. I don't know how to describe it except to say that I have never seen a straight key with more adjustment knobs on it. I found that intriguing, because there are only so many things you can adjust on a straight key. I will try to find out more about it and put it in the column in the near future.

To the newcomer to CW operation, the variety of available keys and keying equipment must be bewildering, indeed. In order to try to make some sense of it all, we will discuss the gear in three groups — manual, mechanical, and electronic.

Manual keys range from compact heavy-duty models designed for incorporation in military transmitters, to flashy works-of-art on marble bases, costing many dollars. A Morse key is really nothing but a switch, and you could use any on/off switch as a key. You could make a quite functional key out of scrap timber and junk metal, but before you spend a lot of money on a 'good' key, it is important that you understand what you are paying for. The most important factors are ease of operation and operator comfort. There seem to be two basic designs in use among the amateur population. Most Australians would be familiar with the 'high-mound' round-knobbed key of the British pattern. Design follows function, and in this case, the structure of the key is determined by the operating style, which has the forearm held above the table. Americans, on the other hand, key with the forearm resting on the table, so a low-profile, flat-knobbed key is more appropriate. Why these two widely different styles have developed is beyond me, but it is safe to say that you should use the style which suits you best whether it is British, American, or Australian.

A problem with manual keys is that they get pounded, and therefore have a tendency to move around on the table. The solutions to this problem are legion. One of many found in "Hints and Kinks for the Radio Amateur" (published by the ARRL and available from WIA Divisional Offices at reasonable cost), is to place the key on two pieces of fine-grade sandpaper, glued back-to-back. Of course, the only fool-proof method is to bolt or screw the key firmly to the table, but this method has the drawback that the location of the key is fixed (and it is definitely not the way to win the heart or co-operation of the XYL if you have to operate from the dining room table!).

Mechanically, most people seem to prefer a key with a great deal of inertia in the key lever, so a fairly massive bar is preferred. Additional mass is given to many keys by building them onto a heavy metal base, or even marble base, which helps to keep the thing in one spot, as well as contributes to the price. As far as the engineering of the key is concerned, there isn't a whole lot of variety. Adjustments to spring tension and contact spacing is usually, if not always, provided for, but you should ensure that once set, these adjustments won't move. Contacts should meet squarely or arcing will cause a build-up of dirt. Contacts should be cleaned by drawing a piece of paper between them; they should never be filed.

If there is an apparent need to file the contacts, something else is grossly wrong. Most of the keys readily available to the amateur are of good quality, and it is just a matter of finding the one that 'feels right'. The cheap and nasty keys that come with practice oscillators should be avoided like the plague, or you will develop bad keying habits in order to compensate for a bad key.

The best advice for the prospective purchaser of a key is to try several varieties, so you can determine the type that suits you best — before spending a lot of money on the 'lifetime' key, with contacts of gold.

The ordinary manual key cannot be beaten for simplicity and ease of operation, but there is still a lot of room for improvement. Some truly marvellous machines have been devised to simulate the actions of the hand in sending dots and dashes. Driven by springs and/or weights, they are all mechanically complex.

Basically, mechanical keys fall into two categories, semi-automatic and automatic. Either variety can be driven by a single paddle, which is moved to one side for dots and to the opposite side for dashes, or by separate dot and dash paddles. The semi- automatic variety will send a string of precise dots when the dot lever is actuated (or when the single paddle is swung to the dot side) but dashes are produced manually. There is often a problem in matching the speed of the dashes, or their spacing, to the mechanically generated dots, and if the dots are sent too quickly in relation to the dashes, the sending rhythm is distorted and the result can be very difficult to copy.

Electronic keyers come in three basic types — manual, single paddle (side-swiper) and dual paddle (the lambic, or squeeze- keyer). Oddly enough, the 'manual' electronic keyer is the most recent in development. I have designated it a manual keyer because it is driven by a straight key. Called the 'Fist Fighter', it acts as an electronic interpreter; it receives sloppy signals you generate with a hand key, determines whether you intended to send a dot or dash, and generates a precise dot or dash for your transmitter, with appropriate spacing. I expect one would have to be reasonably consistent to make the thing work, so one would have to assume that if the 'Fist Fighter' can read your sending, a human ear should have no trouble. 'Fist' is usually defined as a distinctive sending style, and as such, is something to be frowned on — every operator's goal should be to send 'copper-plate' Morse which is not distinguishable from perfect, computer generated Morse, so this is the area where the 'Fist Fighter' should be of benefit. In other words, it enforces a discipline on the user, and ultimately trains one to send code so well that aids are no longer needed.

We will continue with electronic keyers next month. 73 till then.

AR

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Well, we've made it to another year, and I wish you all the best for 1986. I hope you all had a good festive season, and have a couple of dollars left after all the expense that goes with it!

I have written to the DOC and asked them to remind the USSR of their promise to remove the offending station "UMS" from the 15 and 20 metre amateur bands.

Some positive action has been taken re an Australian intruder, viz: Radio 5AN, Adelaide. The ABC has told us (via VK5GZ and VK5TL), that they are taking steps to remove the fourth harmonic from 3.564MHz. Nice to get some good news once in a while.

DAYLIGHT SAVING CHANGE

The Wednesday Intruder Watch Net, formerly on 3.540MHz, is now held on 3.595MHz, at 1030 UTC, but during Australian daylight saving, as last year, the time will be 1000 UTC. Anyone, of course is welcome to join in, if you beat the QRNI

DESTROYED BY FIRE

The nuisance intruder on 7.098MHz, "RRI", from Indonesia on AM, recently had their studios destroyed by fire, but the transmitter survived. *(I'll have to tell our man in Indonesia to make sure he gets the transmitter next time! ! !).*

CYCLING ON

News has it that the upcoming solar cycle (22), will be well below average, which is bad news, so we may have to wait until cycle 23 to get ideal conditions, once again. But at least it has to be better than it has lately. Intruder activity is increasing, particularly on the lower bands, due to the state of the cycle.

We hope that they will QSY to their own frequencies when the conditions improve.

A lot of jammers have been heard on 40 metres also, of late.

FIRST CERTIFICATES

In this column for November 1985, I mentioned the striking of an Intruder Watch **MERIT CERTIFICATE**, to be awarded annually to those persons who had given good support to the IW in the previous 12 months, irrespective of Divisional location.

I have much pleasure in announcing the recipients for 1985:

Col Robertson VK4AKX Certificate No 001
Robin Harwood VK7RH. Certificate No 002
Ivor Stafford VK3XB..... Certificate No 003
Jeff Wallace VK5BJF..... Certificate No 004
Frank Hine VK2QL..... Certificate No 005
Norman Richardson VK4BHJ .....
..... Certificate No 006

Congratulations to these people, and I hope that they will accept the Certificate as a measure of our thanks for helping out so well. A lot of other people were in the running for 1985, and no doubt will qualify in 1986.

THANK YOU

It is time to again say thank you to those who sent in reports of intruder activity for September 1985: *Peter Boskos, A Bradford, and VKs 2BQS, 2DEJ, 2PS, 2QL, 3BGH, 3XB, 4AKX, 4BG, 4BHJ, 4BTW, 4KHZ, 4MR, 4NUN, 5BJF, 5GZ, 7DQ, 7RH, and 8HA.*

AM Intruders reported totalled 335; CW 141; RTTY 74; with 22 on other modes, and 76 intruders identified.

JUST REWARD!

I have just received the news that Peter Boskos, mentioned above in the list of observers, a SWLer who has been supporting the IW for some time, now has the call sign of VK2KPI — well done Peter.

Thanks also to VKs 5TL, 5GZ, and 4AKX for information received re intruders.

See you all again next month, and I will look hopefully to the mail for contributions to the Intruder Watch.

AR

Whilst there may not be very much DX on the bands, there is still plenty of Intruders making good use of some amateur bands.

Make your listening time profitable by making out an Intruder Report and mailing it to your Divisional Intruder Co-Ordinator.

Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Well, another year has arrived! It is sobering to realise that we are only 15 years away from the 21st Century! *I wonder what short-wave will be like then?* I expect that modes such as CW will have been replaced by SITOR or similar micro-processor-related systems in the commercial sphere. Every month, I am hearing more utilities switching over to Telex by Radio (TOR), which gives increased security and accuracy. When I look back on the number of HF coast stations 15 years, or more, ago, there were only a handful of stations using it, mainly in the USA, but today, more are going over to SITOR. This is primarily because the equipment is readily available, and economical to use.

SATELLITES IN USE?

Will we also see some HF services disappear, only to return using geo-stationary satellites to pass their traffic? Yes, I think that will be so, especially in the technologically advanced nations. However, the high outlays involved in satellites, and their ancillary ground equipment, could be beyond the reach of some developing nations, who will find it more economical to continue using HF

Will there still be stations, such as the BBC World Service, Radio Australia, or Radio Moscow heard on short-wave? At this point in time, it is too early to say. We could have direct broadcasting satellites (DSB) on television. This could appeal to the average man-in-the-street, as it would be the ability to see rather than hear. Yet, DSB does have its limitations, mainly the number of channels are limited. I would expect that the larger organisations, such as the BBC, United States Information Agency, Japan's NHK, or American commercial TV networks, could be interested. It depends on the size of the audience. The different television technical standards are also a problem with broadcasting from satellites.

Interestingly enough, the USSR already uses DBSs to relay their domestic radio and television to the Far East and Siberia. I believe that some enthusiasts in New Zealand have received Soviet television via satellite. Viewers in North America and Europe have been able to do this for a couple of years. The Soviet system is fed by DBS onto a standard Soviet UHF channel. Our AUSSAT is not a direct broadcasting satellite, as it is only for subscribers, who require specialised decoding attachments and an earth station to receive the TV feeds, as well as being in the SHF range.

MOST VIDEOS

It is highly probable that cable, or subscription television will be restricted here, in Australia. For a country the size of Australia, the economic outlays would be considerable, so it will probably be in a restricted area. I believe there are some legal problems involved in its introduction. As Australia has the highest number of videos per capita in the world, it is more feasible to install videos than cable or subscription systems.

INTERFERENCE

Videos have introduced problems for the amateur radio operator, as I can recently attest. These are susceptible to nearby RF fields and pass them onto your television, *or should I say their television!* The average viewer is not interested in the technical complexities behind the problem, and wishes to enjoy their viewing without annoying herringbones on the picture, or "duck-talk" on the audio. The proliferation of sophisticated micro-processor controlled electronic equipment into the family home, has made life so much easier, but in turn has caused problems for the average amateur, especially if he/she lives in a built-up area. It is increasingly difficult to avoid getting into somebody's electronic system, and the easier way-out to satisfy the viewer is to silence the annoying amateur. Although technical modifications are available to suppress any stray RF fields entering to the circuitry, the complainant is often reluctant to have this done. *Will this restrict the HF operation in suburban areas by amateurs?* I think it has in some areas. Many operators are now wishing they had a little farm, or shack, down by the sea, well away from any potential TVI and EMC hassles.

Perhaps that is why I mainly listen these days, instead of enjoying a ragchew. The hobby is not what it used to be. With the virtual information explosion related to the theoretical and technical sides of the hobby, it is increasingly difficult to keep abreast. The number of old-time amateurs are decreasing, and radio is all computerised into milli-second pulses.

DELIBERATE JAMMING

While listening around, have you encountered a pulse that sounds like an ambulance Klaxon? This is no OTHR system, but an ordinary jamming station, quite unlike the usual "white noise" or over-modulated audio that one usually associates with jamming. It is located in the Middle East and broadcasts from the BBC, Syria, Deutsche Welle, the VOA, and, in particular, Iran have mainly been affected. There has been a major conflict in the area for about four years now, and both sides have been making extensive use of propaganda via radio, and one group have now reacted by deliberately jamming the others programming.

The Iranians have launched a clandestine outlet, which is mainly in our exclusive 40 metre allocation. This is rather difficult to hear as the jammer is very effective, and it is easily observed here. Between 1200 and 1300 UTC, on approximately 7.086 or 7.051MHz, it is easily heard, also on 7.105MHz.

INTRUDERS

Another broadcaster has appeared on our exclusive 7MHz allocation. "The Voice of Greece", in Athens, is on 7.095MHz in Greek, from 2100 to 2150 UTC, beamed to Australia. I seem to recollect that the same broadcaster operated on 21.445MHz, just inside our 21MHz allocation, which was also to this region, a few years ago. The signal was fairly strong, and was also *on* its usual channel of 9.420MHz, but not as strong. It appears as if intruders are now a fact-of-life. Although the Chinese power-houses on 7.025 and 7.095MHz are gone, it has been observed that, there is yet another lower level signal in one of the minority languages on at 1230UTC.

Radio Beijing is heard in Russian, on 7.025 and 7.035MHz, but are well down underneath the jammers. The Chinese have, in fact, dropped down to 80 metres, as from October. They have re-appeared on 3.535 and 3.640MHz, in parallel. This usually happens in their winter season. We have, as well, our usual quota of summer atmospherics, which have been quite severe at times. Fortunately, propagation on the higher frequencies has improved slightly during our evening hours.

Incidentally, Radio Australia's "Talkback" programme has now been slotted to Saturdays at 0310 and 0810 UTC. There are other releases, but I don't have these to hand. The BBC's "Waveguide" can also be heard at 0750 UTC, on Sundays, repeated at 1115 UTC on Tuesdays, and 0430 Wednesdays.

RELAXING WITH A GOOD BOOK

I recently obtained a copy of the book "From Wireless to Radio" by Bill McLaughlin. It is not a technical book, but rather the story behind Broadcast Station 3DB, in Melbourne. It is a history of the station's development from 1927, up to the present time, concentrating on the on-air personalities from the 20s to today. It is certainly very readable and brings back memories of the programmes I heard in my early listening days.

It has been published by the Herald and Weekly Times, who own the station, and costs $11.95 posted[1].

Well, it only leaves me to wish you a happy 1986, and hope you enjoy listening during this year. Until next time, the very best of 73 and good listening — Robin VK7RH.

1 Herald and Weekly Times, 44-74 Flinders Street, Melbourne, Vic. 3000.

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ARMED RAIDERS HIT ELECTRONICS RETAILER

Communications equipment, worth in excess of $23 000, stolen during an armed hold-up at the premises of Amateur Radio advertiser, GFS Electronics, could be used for criminal activity.

Three gunmen raided the premises in November, terrorising the manager, Greg Whiter, his seven year old son Bradley, and two employees, Alf Thompson VK3DFW, and a female office assistant Karen. They were forced into a rear store-room, bound, blindfolded, and gagged as the bandits demanded two metre transceivers and cash.

Greg said the men required amateur band hand-helds, but there were none in stock. Greg was struck over the head after telling them where the cash was kept, but they couldn't find it and thought he was just stalling them.

Greg 'saw stars' when hit, and needed medical treatment for a cut head. Greg and Alf also had their wallets stolen.

One of the bandits brandished a pistol, another carried, what was believed to be, a double-barrelled shotgun. The first was about 40 years old, 183cm, brown greying hair, olive complexion, and of medium build. The second was in his early 20s, 175cm, short fair hair, fair complexion, and medium build. The third wore a stocking mask. More voices were heard by the victims, and police believe the two bandits could have been joined by accomplices.

The Nunawading CIB and Armed Robbery Squad are in charge of investigations into the crime.

Equipment stolen was as follows:

30 SX-155 Programmable Scanners (new) Serial Numbers Unknown
1 SX-155 Scanner (used) S/N 6715029
1 SX-155 Scanner S/N 6715001
2 FS-10 10 channel Pocket Scanners S/N 5861
1 C-800 10 channel Pocket Scanner S/N Unknown
2 ATC-720X Airband Transceivers S/N 710180, 710009
26 G58 5/8 Telescope Antennas
1 CH-1502 Charger S/N 13457
6 FRP-501 Fire Pagers S/Ns 15084, 15101, 15091, 15100, 15085, 15095
5 AR-2001 Scanners (new) S/Ns Unknown
1 AR-2002 Scanner S/N 00381
3 C-900 Talkman Transceivers S/Ns 80029. 90109
6 M25T VHF HiBand Whip 5/8 Antennas
6 M22T 1/4W VHF HiBand Antennas
Also about 25 various crystals.

Any members offered any of the above equipment are advised to contact the above Police Departments or your local Police Station.

AR

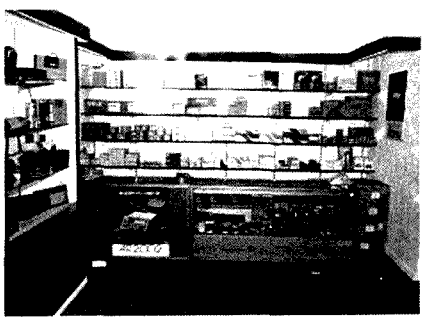
AWARDS MANAGER

All members interested in collecting awards please note that, from the first of this month Ken Hall VK5AKH, will take over the role of Awards Manager. All applications for WIA awards and award material for inclusion in these pages, should now be directed to Ken at *St Georges Square/Rectory, Aiberton, SA. 5014.*

A R Showcase

EMTRONICS OPEN IN VICTORIA

The 1st November 1985 saw the opening of Emtronics in Melbourne. This Sydney based company has established an outlet at 288-294 Queen Street, Melbourne, with the entrance off Little Lonsdale Street, becoming the "amateurs end of the city" for the VK3 amateur.



Much thought has gone into the setting-up of this operation, with adequate displays which customers may view (as the photograph depicts), and customer liaison that is available.

Parking is readily available for participating buyers, also a cup of coffee and the expertise of Fred VK3ZZN and Tracey who are the custodians of the electronics complex.

Don't be shy, call in and see a break-through in electronic purchases, meet Fred and Tracey over a 'cuppa', and discuss your requirements, or give them a call on (03) 67 8551 or 67 8131.

AR

SCALAR GROUP

Scalar antennas have made a name for themselves, both in Australia and overseas, in the professional communication market.

Those who use the company's products realise the success of a communication system's overall performance depends on precision antenna engineering to exacting electrical and mechanical specifications.

Scalar Industries was formed in April 1973, when the British-owned Belling and Lee company closed its Australian operations. Managers of Belling and Lee formed Scalar and, with experienced engineering and manufacturing personnel, set out to design antennas to meet the requirements of industry and government. That objective was achieved, and Scalar antennas are to be found in a wide range of applications on HF, VHF, UHF and Microwave.

For example, the company is the prime supplier for antennas used by Telecom's mobile telephone service. Also the Defence Department, OTC, Emergency Services, Railways, Taxi Services, Paging Systems, and Broadcasters, are just some of Scalar's customers.

Scalar prides itself on its Research and Development Department, which is up with market trends and comes up with answers to antenna application problems.

Its headquarters, at Kilsyth, in eastern suburban Melbourne, has a test range to ensure their products performance and specifications.

As well as supplying antennas, Scalar have a full range of accessories — dummy loads, coaxial switches, cable harness, coaxial connectors, cables, mounting hardware, signal splitters, duplexers, cavities, and low noise amplifiers, to name but a few.

The company also stocks, and is agent for a variety of imported specialised communications equipment, and have just released some new antennas.

The Tunable Mobile Coaxial Dipole Antennas, BFB1, BFB2, and BFB3 have been added to the Scalar range of ground independent mobile antennas and are primarily designed for installation on vehicles operating in off-road, and other heavy duty situations such as road construction, mining, and emergency situations. They are also admirably suited as base antennas.

The antennas are enclosed in specially reinforced fibreglass radomes. They are field tunable throughout their range — 70-65MHz, 118-136MHz, or 148-175MHz.

The Scalar HM12 series of HF Marine Antennas (2-10MHz), have been designed to provide economical and reliable communications for small craft. The radiating elements in these whips have been impregnated into the fibreglass wall during manufacture to ensure durable long-life structure.

The bulk head mount caters for sloping or vertical cabin sides. These units are designed to operate effectively down to 2MHz when used with a HF tuning unit.

For further information about the Scalar range of products contact Scalar Industries Pty Ltd, 20 Shelley Avenue, Kilsyth, Vic. 3137. Telephone: (03) 725 9677. There are also Branch Offices in Sydney, Brisbane and Perth.

AR

TARA PATCH

A new phone patch unit for radio amateur operators has performed exceedingly well during tests between Melbourne and Gippsland.

Using an FT101B transceiver, the Tara Patch gave good audio quality, and was easy to operate. An in-built speaker allowed the radio operator to monitor both the off-phone conversation and off-air audio.

Manual switching from transmit to receive was a simple operation — and enabled full control over the third party traffic being patched.

Tara Patch is Telecom Type Approved, and replaces an earlier version which was available last year. Considerable developmental work has gone into the new model to overcome RFI problems, which appeared in some circumstances with the earlier version on HF.

The unit is more than a phone patch — it provides the permanent interfacing of up to three transceivers at the flick of a switch, it is a complete 'ready-to-go' unit, and has adequate printed instructions and circuit diagram.

Inquiries may be directed to Tara Systems Australia, 6 Malvern Street, Bayswater, Vic. 3153. Or phone (03) 729 0118.

RTTY/CW COMPUTER INTERFACE

A computer interface designed to connect to a radio transceiver or receiver, and allow computerised RTTY/ASCII/AMTOR/ARQ/FEC/CW operation, is now available.

Known as the Model MFJ-1224, and manufactured in the USA by MFJ Enterprises, it offers its users a number of unique features. For example, it may be used on most of the common computers available today due to its versatile I/O circuitry. Included in the units price is a CW/RTTY software cassette to suit the VIC-20/C-64.

The MFJ-1224's design makes use of a sharp eight pole, active filter when in the 170Hz shift or CW modes. This, coupled with its XR 2211 PLL detector provides good copy from almost unreadable signals. It is capable of operating on 850 and 425Hz, as well as the 170Hz shifts.

Signal tuning is made relatively easy due to its two LED tuning system. A reverse/normal sense switch is also provided for receiving reversed signals.

Operation on modes such as AMTOR, ARQ, and FEC, are accommodated by the MFJ-1224 interface, provided its host computer has the appropriate software. A single DC power source of 12 to 15 volts is all that is required for its operation.

The unit is priced at $345 plus $14 p&p from the Australian distributors, GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

AR

LOCAL MOBILE RADIO

Amalgamated Wireless (Australasia) Limited, (AWA), has transferred the manufacturing of its RT-85 Mobile Radio from Japan to its New Zealand based company, AWA New Zealand. This allows for reciprocal manufacturing advantages as New Zealand manufactured communications equipment is considered 'locally' made by Commonwealth and State Government departments.

AWA Land and Mobile Communications Manager Don Jamieson (left) and AGL Operations Manager Brian Chapman, holding the first New Zealand manufactured RT-85.

AUSTRALIA'S FIRST UHF-ONLY TV NETWORK

From 5th January 1986, VHF Channel 0 will cease transmission in Melbourne and Sydney, making SBS-TV Australia's first UHF only television network.

The network, the multi-cultural television arm of the Special Broadcasting Service, will continue its transmissions in both cities on the existing UHF wave-length. This move follows the Federal Government's decision to make SBS-TV a UHF only network, and place future television extensions on the less-congested UHF band.

The current VHF band is widely used by TV and FM radio stations, leading to overcrowding of the wave-length. By making use of the UHF band, transmission services will be clearer, crisper, and less prone to interference.

When SBS-TV began transmission as Channel 0/28 in October 1980, it was available on VHF Channel O and UHF Channel 28. Since then, the network's expansion has been on the UHF band only. The use of the VHF 0 signal was only a short-term proposal by the Federal Government to allow viewers time to appreciate the new network, and gain a complete understanding of the then-new UHF television.

Viewers should have little difficulty receiving adequate UHF transmissions, provided they have the correct equipment, which includes a television set or VCR with UHF capabilities and, in many cases, a suitable outdoor UHF antenna.

For further information contact SBS-TV Publicity, Sydney (02) 923 4811/(008) 22 6322 or Melbourne (03) 690 5233.

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

A warm welcome is extended to the following members who joined this Division during October 1985.

J Bradshaw VK3ZFM; Graham Burton; H Crow; Gary Evans VK3XGE; Frank Foulds VK4BBN/ZL3JI; John Gurney; Carl Jackson; Clinton Jeffrey VK3KJN; Dennis Jurisinec VK3ZRN; Kevin Leydon VK3KLK; F. Lock; Ivor Lyell; Christopher Peake VK3KCP; David Ross VK3PKO; Max Scane; Joseph Taylor VK3CVB; George Wilson VK3KIJ; Gordon Yorke VK3ABI; Michael Xuereb VK3NMX.

AR

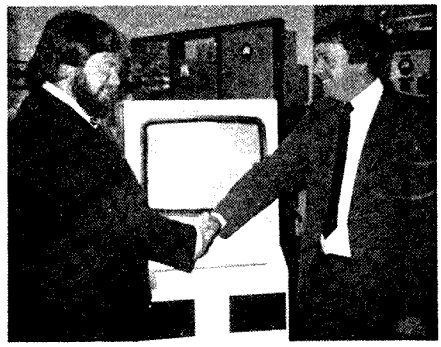
Ted Holmes VK3DEH, and Harry Kraehenbuehl VK3KBA, one of the regular team of announcers on the Sunday Morning Broadcast through VK3BWI. A regular feature when this pair is doing the Broadcast is Ted's "Trivia Quiz" for those who take part in the two metre call-back.

Photograph courtesy Jonathon Marshall VK3PRN

PUBLIC RELATIONS

The Public Relations activity of the WIA Victorian Division has been given a real boost following the donation of a video display unit.

Due to a kind donation from GEC Automation and Control, the sole Australian distributor of National brand professional and commercial products, the message of amateur radio is effectively reaching an audience.



Graeme Burbridge, presents the Video Display Unit to WIA Victorian President and Public Relations Officer, Jim Linton VK3PC.

Photograph courtesy Alf Chandler VK3LC.

The unit, valued at $4 000 is designed for the continuous displaying of video messages, and is widely used in retailing establishments. It has been installed in the Science Museum of Victoria, as part of the VK3AOM demonstration station.

When VK3AOM is not manned by volunteers, the passing public only have to press a button to see a six minute video from the WIA Videotape Library — Amateur Radio .. The National Resource of Every Nation.

Our sincere thanks go the Graeme Burbridge, National Sales Manager of GEC Automation and Control, for this generous donation, and the Science Museum of Victoria for its co-operation in having the unit installed.

The idea of having a video display facility came from Allan Doble VK3AMD, who negotiated, on behalf of the WIA, with both the Museum and GEC for almost a year. Congratulations Allan on thinking of the brilliant idea and riding it through to the winning post.

AR

Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT. 2606

MEETINGS FOR 1986

The next Divisional Meeting will be held on 20th January, at the Griffin Centre, Civic. Doors open around 7.45pm, for the bookstall and QSL bureau, with the meeting commencing at 8pm. The Annual General Meeting for 1966 will be held on Monday, 24th February, at the Griffin Centre, Civic, starting at 8pm.

One of the functions of the AGM is to elect office bearers for the 1986 year. All members of the VK1 Division are eligible to stand for election to any committee position, and it appears that a number of long serving members may not stand for re-election. Any member interested in standing for a committee position should contact the Public Officer, Alan Hawes VK1KAL, for nomination forms and further details. Serving on the committee can be very satisfying, and need not be an onerous task if all pull their weight. This could be your chance to put something back into our hobby of amateur radio, and can be a very enjoyable and rewarding experience.

Also, at this meeting, there will be a motion to alter the constitution of the VK1 Division, to bring the rules regarding financial members into line with the new cyclic billing procedures for the WIA, as a whole.

VK1 AWARD UPDATES

Phil VK1PJ, has informed me of the VK1 Awards which have been issued up to 5th November 1985. These are:

VK7NAI — Silver Upgrade
VK2PXS — Basic
VK6OE — Basic
VK1ZXA — Silver Upgrade — VHF
VK1HZ — Gold Upgrade

Congratulations to all, particularly to those earning upgrades.

UHF BEACONS

Two new beacons are operating in VK1. Details are:

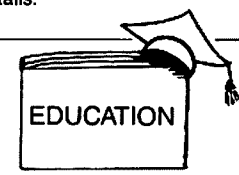
Call Sign — VK1RBC
70cm — Frequency 432.410MHz, Coaxial Collinear Antenna
23cm — Frequency 1296.410MHz, Slot Radiator Antenna
Mode — AFSK
Output Power — 10 watts

These are currently located at the QTH of Ron VK1RH, in Melba, one of the NW suburbs of Canberra. Both beacons were built by Dick VK1ZAH. Our thanks to Dick for his effort in constructing these beacons.

JOHN MOYLE FIELD DAY

Don't forget the Annual John Moyle Field Day Contest — the VK1 Division will operate a serious station, this year, as opposed to a demonstration station, as in past years. We will need operators and equipment — contact any committee member for further details.

AR



Pamphlets showing the syllabus for the AOCP and NAOCP examinations are now available from the Department of Communications

Intending candidates should obtain a copy of the appropriate paper, prior to the May 1986 examination.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

DIVISIONAL OFFICE

The telephone number for the Divisional Office is (02) 689 2417.

BROADCASTS

The VK2WI Broadcasts ended for 1985 on 22nd December. The first 1986 broadcast will be on 12th January.

DIVISIONAL OFFICE

The Divisional Office will be closed over the holiday period. It closed on 20th December and it will not open again until Monday, 6th January.

AGM 1985-86

Members are reminded that the Divisional Year ended on 31st December. It is now the time for the various sub-groups to submit their reports for inclusion in the President's Annual Report. The AGM will be held on the first Saturday after Easter.

The new year also brings the requirements of a new Council and members are requested to consider serving on the Council. Besides needing to be able to attend the monthly Council meetings, you need to be able to attend the Parramatta Office on a regular basis to carry out some of the other duties which form part of Council involvement. Nomination forms are available from the office.

CENTRAL COAST FIELD DAY

Mark you appointment book for the third Sunday (16th) *in* February, for the Central Coast Field Day.

NEW BEACON

The latest Divisional Beacon went on air on Sunday, 3rd November 1985. The 23cm beacon is on 1296.420MHz, with approximately five watts omni-directional antenna, horizontally polarised, 30 metres above ground, and located at Dural (about 270m ASL). Reports are sought and a QSL card will be sent for all cards and written reports received.

It is part of the VK2RSY system and is keyed from the common identifier.

JOHN MOYLE MEMORIAL FIELD DAY

Are you ready for the 1986 event? No doubt you saw the 1985 results in Amateur Radio. Wagga ARC took out the Open 24 hour Section with 16 500 points and Oxley Region ARC the six hour Open Section with 1607 points.

How about you club setting up a station this year?

FOR SALE

The Divisional Store has available a quantity of 10.700MHz crystal filters. The are from two manufacturers, Hy-Q and ITT, for printed circuit mounting. Frequencies are 10.700MHz ± 7.5kHz. For personal or mail order sales, they are two for $5.00 post paid.

REPEATERS

Repeater applications for a two metre system to serve the Tumut area, and a 70cm unit at Wagga were received in November 1985. Both were well presented and documented, and required only checking with VK1 and 3 to determine and confirm suitable channels. It is expected that by the time these notes are published they will be ready for license submission.

During November, repeater groups were sent a pager interference report concerning some systems in the 147-148MHz segment. Investigation is continuing into this matter. Amateurs receiving (pager) interference to other repeaters or simplex channels in any mode, any band are asked to advise the Divisional Office, via the Post Box address, or phone (02) 689 2417, 11am to 2pm, Monday to Friday, or Wednesday evening, 7 to 9pm.

REPEATER ABUSE

Most readers will be aware that, in recent times, much of the anti-social behaviour on ch 7000 has ceased. There are still some pockets of abuse directed to certain people whenever they come *on* air, or problems arise where some operators appear as though they should be subjected to a RBT prior to operating.

After a long period of investigation by various authorities, a person located at Ryde, was arrested and charged with harrassment, by telephone, of several amateurs in Sydney. There were also drug and fire-arm related charges. The various charges brought financial ($1600) and community service (200 hours) fines. Information gained during these investigations by the authorities are helping with other matters which should see a further clean up of the problems.

BLANK QSL CARDS

A re-print was recently completed and the full colour range is again available.

Copies of the latest Call Book are still available, together with most publications and clothing. Check during office hours for the availability of any of these items.

HOME-BREW CONTEST

Building something during the holiday period? Why not enter it in the present contest? This contest closes at the end of February. The results will be announced at the Seminar, in March, which is scheduled to be held on Saturday, 8th March.

NSW AWARDS

The Division is considering the introduction of some awards. The type to be chosen is still being looked into, but are expected to be along the lines of the VK3 National Parks, or the VK4 Shires awards.

Any input from members would be most welcome.

In closing, may I, on behalf of the Division and its office bearers, wish all members the best for this New Year of 1986.

AR

FIFTY YEAR HONOUR ROLL

In response to the Editorial in November Amateur Radio, page 7, Alan Shawsmith VK4SS, has written to advise that he has been a member of the Institute prior to passing his AOCP in August 1935. Alan is very active today compiling historical articles for the VK4 Division, and this magazine.

Austine VK3YL, has been a member for 56 years, and has been licensed for 55 of those years. Austine is still very active 'chasing DX', and is as keen on the hobby today as when she first became interested.

Ivor Stafford VK3XB, (Life Member of WIA) has been a member of the Institute for 51 years. Ivor has always been very active in Institute affairs. He was Outwards QSL Manager in Victoria for 14 years and was also Victorian Intruder Watch Co-Ordinator for quite a period. Ivor continues to work for the Intruder Watch and is recipient number three of the newly inaugurated Intruder Watch Certificates (see Intruder Watch column), which are awarded for support to the Intruder Watch. Ivor is a keen CW-man, and his name can frequently be seen in the contest column results. He is also heard regularly on the HF bands chasing the elusive DX, usually on CW! Ivor helped to celebrate the 75th Anniversary by using the VK75A call sign and also attending the Dinner on 9th November 1985, with his charming XYL, Mavis VK3KS.

Bill Seivers VK3CB, began experimenting with amateur radio during 1918, and joined the Institute in 1922. Bill is still an active participant in the Institute, and was seen to be enjoying himself at the 75th Anniversary Dinner, last November.

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

SEEN AT THE QUEENSLAND RADIO CONVENTION 1985

LEFT:

FROM LEFT: Ron VK4EN; Bernie VK4FOS; Betty VK4BET; Charlie VK4IQ; Lloyd VK4ALW; Max VK4BMW; Evelyn VK4EQ; Richie VK4RR; Les VK4LZ; Alan VK4PS; Ross VK4RO; Bill VK4XZ; Gordon VK4AGZ; Roger VK4CD; Bob VK4WJ; Ian VK4ZT.

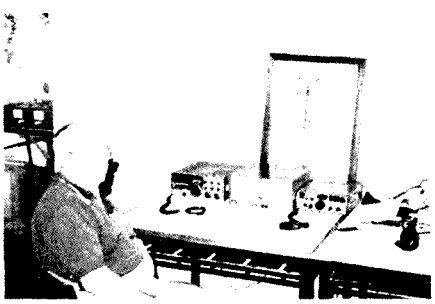
BELOW:

FROM LEFT: Guy VK4ZXZ, VK4 Federal Councillor, Brian VK4RX, QTAC, Charles VK4BPI, MARC President, Colin VK4EX, CARC President, Roger VK4ARZ, Mt Isa Club Secretary.

FRONT FROM LEFT: John VK4QA, VK4 President, Ann VK4KXZ, VK4 Bookshop, Val VK4VR, VK4 Service/Liaison, Bob VK4WJ, TARC President.

Professor James Ward of James Cook University performing the Opening Ceremony.

John VK4QA present Les VK4LZ with his WIA Merit Award Badge.



Charlie VK4IQ.

Max VK4BMW and John VK4FNQ, joint winners of the Ed Roche VHF Achievement Trophy, are presented with the Trophy by Ed VK4KAA.

Don Bryant (left) and Col VK4ZCR, updating registrations at the Convention.

Cook for the Convention John VK4AFS, carefully watched by Ken VK4KT and his XYL, Judy.

Dale VK4KDM.

Bob VK4WJ checks the Historical Display.

Club Corner

VICTORIAN AMATEUR TELEPRINTER GROUP

Following a committee meeting held on 30th October 1985, it was resolved that, as from the first RTTY Broadcast for 1986, a frequency change from 3.545MHz to 3.630MHz will be implemented.

This frequency change will be in line with the recommended Band Plan for Region 3 RTTY Broadcasts.

it was further decided that the BAUD rate for these broadcasts will stay at 45.45 BAUD until further notice, as the committee sees no useful purpose to change BAUD rate until it is a world-wide decision.

The RTTY Broadcast frequencies from this month are:

Two metres VK3RTY Repeater 147.350MHz receive.
Call back on 146.600.
HF 3.630MHz VK3REC.
Call back frequency will be announced during the broadcast.
Date/Time — Tuesdays 0900UTC.

A clear frequency would be appreciated.

Contributed by Lindsay VK3KAF
Chairman VATG

CENTRAL COAST AMATEUR RADIO CLUB

All amateur radio operators, their families, friends, and all interested in amateur radio, are invited to attend the Club's 29th Annual Field Day, to be held on 23rd February 1986, at the Showground, Showground Road, Gosford, NSW.

Events of the day will include: *Open Scramble, Pedestrian Direction Finding Fox Hunts, Pedestrian Talk-In Foxhunt, Ladies and Gents Quizzes, a Ladies Stall, Children's Events, Visit to the Reptile Park, and an Afternoon Bus Trip.*

Catering arrangements will be the same as last year — BYO Picnic Lunch or buy from the Take-Away Food Bar at the Showground. Free tea and coffee is available from 8am to 5pm.

Early booking for accommodation is advisable, as accommodation is usually scarce at Field Day time.

Trains arrive at Gosford Railway Station, from Sydney and Newcastle between 8.30 and 10.30am, and courtesy bus transport is provided to the Showground.

The Field Day will be held rain, snow or hail, as there is plenty of shelter at the Showground.

The VK2 QSL Bureau will be in attendance, and bring a QSL card for the 'Calls Present' board.

For information write to CGARC, PO Box 238, Gosford, NSW. 2250, enclosing an SASE.

AR

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street. Clarence Gardens. SA. 5039

In the October issue of Amateur Radio 1985, we published a photograph of a group who never quite made it for the Australian first XI, but nevertheless, had some fun playing cricket, possibly at a WIA picnic.

Brian Austin VK5CA, and Tom Laidler VK5TL got their heads together, along with some information sent in by Colin Hewitt VK5CT, and between the three of them, they have come up with the names of most of the gentlemen in the photograph. They are as follows:

Top row from left — Jim Vivian VK5HO, unknown, Jim Rosevear, Gilbert Lucas VK5LL, John Bulling VK5KX, and Gordon Bowen VK5XU.
Front row from left — Joe McAllister VK5JO, Len Baker VK5OC, Warwick (Pansy) Parsons VK5PS, Clem Tilbrook VK5GL, and Colin Hewitt VK5CT.

Thank you for taking the trouble, gentlemen.

OUT-OF-DATE

Although, by the time you read this it will be somewhat out of date, I felt that mention should be made on the resignation of John Mitchell VK5JM, as WICEN Director in VK5. John has been involved in WICEN for 14 years altogether, from 1960-64 and from 1975-85. Not that John is going to drop out of sight straight away. He will be on hand to advise Bill Wardrop VK5AWM, who will take over the role of Director from John, and also to get a "Rapid Deployment Group" off the drawing board. On behalf of the VK5 Division, our thanks for all the time and effort that you have put into the position, John.

ELECTRONICS SHOW

Also, somewhat ancient news is my report on the News Electronic Show, at Morphettville. When Bob Allan VK5BJA, agreed to put up the aerials for me, we assumed that we would be on the second floor, where we had been for the past two years, so it was with some consternation that Bob and I viewed our site for this year — on the ground floor, with no easy access to the roof. However, with the help of Jack VK5FV, Lindsay VK5GZ, and Peter VK5PRM, aerials were raised on the roof, and as Siberia and Japan were worked, we must have been getting out okay.

The fact that we had a larger site this year didn't daunt Peter Koen, he just brought along extra display material, including some on JOTA and the amateur involvement in the Mexican Earthquake. Incidently, Peter's daughter, Michelle, was featured in two editions of the "News" that week, advertising our involvement with JOTA, the first with David Clegg VK5AMK, and a Scout, in David's shack; and two days later on her own, as a Guide.

Grateful thanks to the following VK5s who volunteered, or were otherwise coerced into becoming operators.

John VK5NX; Vince VK5ZSV; Max VK5NMX; Jack VK5FV; Colin VK5FX; Bill VK5AWM; Ron VK5AAC; Steve VK5AIM; Steve VK5AOZ; Tony VK5AH; Meg VK5AOV; David VK5OV; Ken VK5AGW; and not forgetting Pauline Koen, who came to help with the display boards. (This year we didn't have to scrounge furniture, we only had to ask!).

To all those mentioned, and anyone I may have forgotten, plus the amateurs who called in to visit us — again THANKS! !

AR

QSP

HALLEY'S COMET

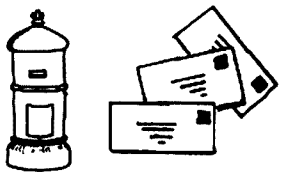
James Young WB6FNI, will operate from the Jet Propulsion Laboratory's Table Mountain Observatory, where he is a resident astronomer, to commemorate astronomical observations of Halley's Comet during the International Halley Watch.

Operation will be limited to 40 metres during the months of February and March 1986, on a non-interference basis with normal observatory activities. Frequencies and times will be: *CW. — 7.120 ± 5kHz from 0400-0500 UTC. Phone — 7.228/7.077. from 0500-0600 UTC; 7.249 from 0700-0800 UTC; 7.228 from 0800-0900 UTC; 7.228/7.084 from 0900-1000 UTC.*

A Certificate and an original 1986 Halley.s Comet photograph, taken at the Observatory will be available for 5 IRCs.

QSL via James Young, PO Box 576, Wrightwood, CA. 92397, USA.

Please note that some of these frequencies are especially for overseas amateurs and are out of the Australian allocation but SWLs may care to listen out for James on them.



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

BEST THING SINCE SLICED BREAD — WELL ALMOST!

"Plastic wrappers for Amateur Radio are the best thing since sliced bread". That and many other complimentary comments have been flowing in to the VK4 Divisional telephone since Amateur Radio changed its outer wrapping.

Several years ago, Alex McDonald VK4TE, and Dave Laurie VK4DT, recommended that plastic wrapping be used, but, at that time, suitable machinery was not available.

Now, dashing out in the rain to retrieve Amateur Radio from the mail box before it is reduced to a soggy mass of paper pulp in no longer necessary. Our monthly journal is securely encased against the elements.

I know that the inevitable teething troubles have caused the Editor and production staff some concern, however, it appears that those problems have now been overcome.

On behalf of the members in Queensland, I thank you all, and look forward to receiving Amateur Radio in pristine condition during the forthcoming 'wet season'.

Guy Minter VK4ZXZ,
Federal Councillor,
4 Angelina Street,
Macgregor, Qld.
AR

BATTERY POWER

Recently I read in the Rad Comm magazine that several transceivers are now totally dependant on an internal lithium battery. If failure of the battery occurs, these models have to be returned to the supplier for re-programming.

Subsequently, I asked several owners of this type of equipment for their opinion of this situation, and they were disbelieving, and assumed that the batteries were merely a "memory back-up" for stored frequencies.

From this point, I continued investigation by reading the equipment reviews in various amateur journals, none of which emphasised the importance of the batteries, and the necessity of returning the rig to the supplier.

Due to the remote locations of some Australian operators, this factor would be an important consideration when purchasing new equipment.

In the future, the life span of these batteries would have to be ascertained when purchasing second-hand equipment.

I look forward to receiving comments on this subject.

Yours faithfully,

John Baxendale VK6JD,
6 Dornoch Court,
Duncraig, WA. 6023
AR

SHOCKED AND DISMAYED

I am shocked and dismayed about the recent jump in examination fees imposed by the DOC.

If the Department cannot keep its fees down to a more acceptable level, the WIA should become the examining authority, with DOC endorsing the results of the exams by issuing the appropriate certificates.

DOC have now authorised approved training institutions to conduct exams for the BCOP and TVCOP with the Department issuing certificates on the results.

I believe that the increase in fees may discourage many young people from attempting the exams and eventually lose interest in this wonderful hobby of ours. This may result in the WIA not celebrating its centenary.

I strongly urge the Federal Council of the WIA to give immediate action to formulating a proposal to become the examining authority for all classes of certificate.

There are many older, experienced members of the WIA who would be well qualified to supervise examinations, on a voluntary basis, on behalf of the Institute.

This could be of great help in many country areas, where the candidates and supervisors should be able to arrange agreeable times and places for the examinations to be held.

Yours faithfully,

Don Martin VK2ARQ,
80 Greenbah Road,
Moree, NSW. 2400

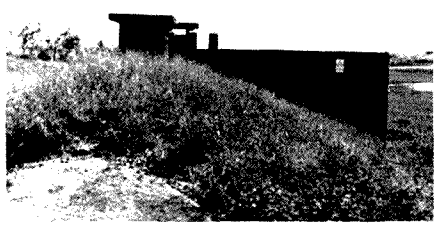
The Institute has expressed great concern to DOC. Possibility of WIA running exams has been considered but would need numerous volunteers in all states. The subject is still under intense scrutiny, both by DOC and the WIA. — ED.

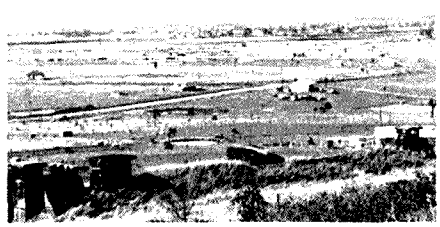
AR

CAN YOU HELP?

I am researching the history of 23 (City of Brisbane) Squadron RAAF, in preparation for its 50th Anniversary, in April 1987. The Squadron was based at Lowood, Queensland, from 1940 to 1944.

I am trying to locate any ex-members of the Army or Air Force who served in the signals bunkers adjacent to Lowood Aerodrome.





The accompanying photographs show one of the bunkers, which is built into the side of Mount Tarampa. The other bunker is five miles (8km) distant, which suggests a remote transmitter/receiver arrangement.

I would be very happy for anyone who served in either of the two bunkers to contact me with any historical information as to their role during World War II.

Yours faithfully,

FLTLT P R (Ron) Burr,
No 23 Squadron,
RAAF Base,
Amberley, Qld. 4305.
AR

CONGRATULATIONS

It is my pleasant task to write and congratulate the Amateur Radio team for the way the the November 1985 issue was edited and produced.

AR came up at our Committee Meeting, and all said that they had enjoyed reading it, and had received very favourable comments from many other members of the Club: *interesting articles, well set out, and easy to read, were some of the compliments heard.*

Thanks very much for the work which goes into AR and keep up the good work.

Best regards,

Gordon Buchanan VK3BGB,
Secretary,
Frankston and Mornington Peninsula ARC,
PO Box 38,
Frankston, Vic. 3199.
AR

RETIREMENT VILLAGE

It was with special interest that I read the article from Harry Atkinson VK6WZ, on a need for a "Veekay" Retirement Village. I have been thinking along these lines for some time and providing that sufficient interest is shown by amateurs for such a needed facility, I would be willing to start such a venture.

The area I have in mind is near a large provincial town in Queensland, is reasonably close to beaches, and air access to southern states is readily available. Also, radio conditions are excellent.

Any amateurs who are interested can contact me at the following address.

73,

Ted Ross VK4ALQ,
PO Box 589,
Caloundra, Qld. 4551
AR

CORRECTIONS TO AMPLIFIER NOISE, NOVEMBER

A number of errors have crept into the above article.

(1) Page 18 — Figure 2 — "En" should be "Vn" to correspond with the text (my error).

(2) Page 18 — Formula should read:

$$F = 20 \log \frac{E_\infty}{A_v \sqrt{1.6 \times 10^{-20} \times B R_s}} \text{ dB}$$

(A_v is part of the denominator and in the printed article the 20 log and dB have become confused).

(3) Page 19 — Figure 4 — The general sense of the curves is OK, but somehow the draughtsman has reversed the log scale on both axes.

(4) Page 20 — Formula should read:

$$E_n = \frac{E_\infty 10^9}{\sqrt{B.A}} \text{ nV}/\sqrt{\text{Hz}}$$

(The square root only applies to bandwidth (B) not gain (Av).

(5) Page 20 — Formula should read:
$E_n = \sqrt{1.6 \times 10^{-20} BIR_s}$ V/$\sqrt{\text{Hz}}$
(Bandwidth (B) was omitted on the original typed draft).

(6) Page 20 — Figure 7 — Plate load resistor should have been labelled R_s — 50ohms.

(7) Page 20 — Figure 8 — 50k resistor should have been a variable resistor.

(8) Page 21 — Figure 11 — (17dB of N & D) should read (12dB of N & D).

Lloyd Butler VK5BR
18 Ottawa Avenue
Panorama, SA. 5041
AR

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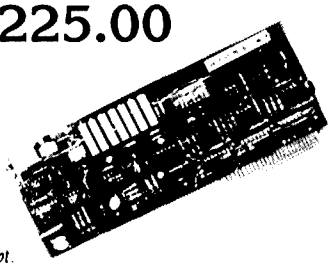
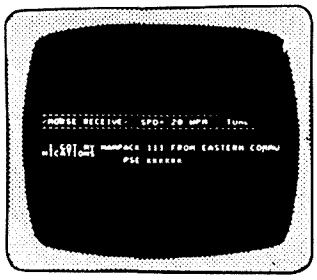
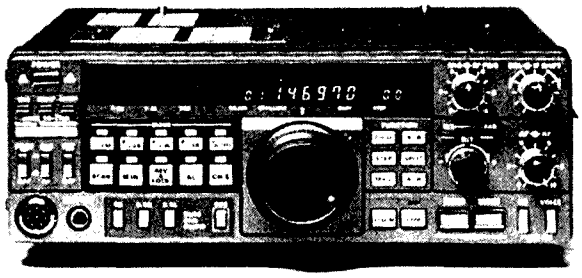
Turn your APPLE II and IIE or compatible computer into a communications terminal. Send and receive Morse code, RTTY and ASCII at any speed from APPLE peripheral slot. Complete with software and instruction manual.



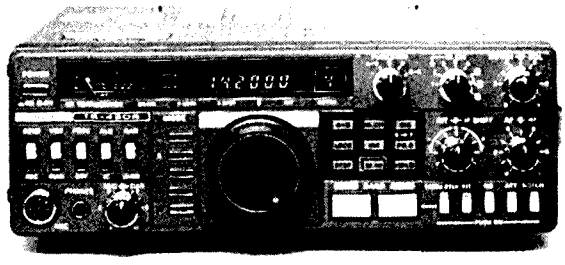


FEATURES ARE:
- *10k Receive Buffer*
- *10k Transmit Buffer*
- *Split Screen*
- *Save Buffers to Disk*
- *Retrieve Text from Disk*
- *Brag Statements*
- *Auto CQ, ID, QTH, etc, etc*
- *Many other features too numerous to mention here*
- *2125-2295Hz + 1300-2100Hz Tones (1200-2400) opt.*



KENWOOD

TS-711A
2 m All mode Transceiver



KENWOOD

TS-430S
HF TRANSCEIVER

AR86

TEST EQUIPMENT — LARGE RANGE OF HIGH QUALITY SECOND-HAND GEAR: HEWLETT PACKARD, TEKTRONIX, MARCONI, BOONTOON, B W D, BRUEL & KJAER, GENERAL RADIO, FLUKE, ATC, *etc.*

WE SERVICE WHAT WE SELL

Silent Keys

It is with deep regret we record the passing of —

MR JAMES BLACKWOOD VK3ABL
MR R N RIDE VK3NH
MR H H (HORRIE) WOODFORD VK3BZH
12.10.85

Obituaries

CLEMENT JACKSON DAY VK3GY

Clem became a silent key on 5th October 1985, at the age of 73 years, after operations and treatment the previous year. Clem survived his wife, Joy, by only three months, as she died suddenly on 29th July, which was a great shock to Clem, contributing to his passing.

Clem was born in Melbourne, but as his father was a postmaster, the family made several country moves before Clem became a part of the work-force. At this time, his father was PM at Camperdown, Vic, so Clem started as a message boy at the Post Office.

Whilst there, learning to read the telegraph sounder as part of his duties, he studied for, and passed the examination for his AOCP, and was allocated the call sign, VK3GY, in 1930.

Clem proceeded to operate on 7MHz during the broadcast hours, and then on the 200 metre band, with music in the late evenings, and Sunday mornings. Clem received reports from listeners in the Western District, and as far away as New Zealand.

He also helped a number of local amateurs get their AOCP.

Later, Clem joined the personnel section of the PMG's Department. At the outbreak of the war, he enlisted in the RAAF, starting on Course 21, Wireless Maintenance Mechanics, in Melbourne. This was where the writer first physically met Clem, after a number of QSOs on 7MHz, dating from 1930.

Upon pass-out from the course, Clem was posted to RAAF Advance Signals, Coomalee NT, and later to No 11 signals unit across the road. After 20 months of tropical service, we were both posted south, Clem going to Essendon.

While in Melbourne, Clem married Joy Marsland, a sister of Jim VK3NY.

After the war, Clem returned to his old position in the PMG, but was told to apply for a new position with the newly formed Department of Civil Aviation, in which he served until his retirement, rising to the position of Assistant Director of General Administration.

Between work and family commitments, radio took second place, but on retirement Clem and Joy decided to return to country life and settled in Wallington, Victoria. This move enabled him to become active on both the HF and VHF bands. It also allowed him to become an active participant in the RAOTC over recent years, and at the time of his death, was Assistant Secretary of the Club.

Clem will be sadly missed by his many friends, and particularly by the writer, as both families have enjoyed an association in excess of 40 years. Clem always had a cheery greeting, and an uncanny readiness to assist where, and whenever possible.

To all of Clem's family we extend sincere condolences for the sudden loss of both parents in such a short period.

Ed Manifold VK3EM

HORRIE WOODFORD VK3BZH

Horrie came on air as an amateur in October 1978.

After losing his sight a few years previously, he attended classes at the VK3 Divisional rooms, was first licenced as VK3NOI, and obtained the full call of VK3BZH shortly afterwards.

But Horrie's Interest in communication dates from CMF days in the early 30s, when he served in a signal unit. Subsequently, he enlisted in the AIF in 1939 as a signals officer, held the regimental number VX42, and was awarded the OBE for his services with the 9th Division Signals at Tobruk and Alamein.

During more recent years, we remember him as a kindly man with varied interests, many involving the welfare of others.

Horrie passed away on 12th October 1985, and deepest sympathy is extended to his widow Hilda, and his family. He will be sadly missed, both on and off air.

Jim Payne VK3AZT

BILL O'BRIEN VK2BWO

It is with the deepest regret that I announce the passing of one of the most popular, and beloved radio operators of recent times, namely Bill VK2BWO.

Bill was active as a SWL, and as a member of the radio club in the eastern suburbs area as far back as the 1930s, but it was not until recent years that he obtained his licence, firstly as a novice — VK2PWO, and then upgrading to VK2BWO.

During the time he spent on air, Bill had the happy knack of making a friend of everyone that had the good fortune to make his acquaintance. On their behalf may I say thanks, Bill, for your companionship, advice, and kind sympathy, you will be ever in our thoughts.

I first met Bill at the opening of the WIA building, at Parramatta, and it was Bill and his XYL, who hopped in to lend a helping hand. It seems that this was Bill's way of life — to be ever there with a helping hand - and by the number of friends from all walks of life who were present at Bill's farewell, his friends on the air are just a small segment of the many who mourn his passing.

To Joan and his family, sincere condolences.

Tom Delandre VK2JTD
AR

JAMES D BLACKWOOD VK3ABL

Jim passed away on the 16th October 1985. He was a member of the WIA and also, the RAOTC.

Born in Melbourne in 1915, Jim obtained his MSc degree at Melbourne University and in 1951 obtained his PhD at Cambridge University. In 1938, he joined the staff of the Munitions Supply Laboratories, in Melbourne, and was transferred to the MSL Branch Laboratory, Penfield SA, in 1942.

After the war, Jim returned to MSL and was transferred to the Chemical Engineering Division of the CSIRO in 1955, where he remained until he retired in 1975.

Jim obtained his AOCP in 1946. He was both artistic and practical. His interests included painting, music, and woodworking.

Jim will be missed by his many friends.

He is survived by his widow Grace, and daughters, Anne and Mary, to whom we extend our deepest sympathy.

Ken Seddon VK3ACS

THOUGHT FOR THE MONTH

It is a sad commentary of our times when the word HONESTY is preceded with the word OLD-FASHIONED.

COMMUNICATION?

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

The occasional Sunday morning gathering of experts on the sunny side of Jim's verandah was discussing the last zone meeting. *"I don't know what the president meant when he said we can't communicate,"* said Nobby. After a pause to top up the glasses Jim said *"I have made a study of the subject since the meeting and I can now give you the benefit of my acquired wisdom."*

Jim was noted for his philosophies and the gathering was respectfully silent as Jim continued. *"My favourite dictionary defines communication as the act of imparting or exchanging information and defines information as items of knowledge. If you freeze on the push to talk switch and natter on like old George here you are not imparting or exchanging items of knowledge and therefore you are not communicating."* *"I agree with that"*, interjected Ali, *"also some short exchanges using VOX do not qualify"*. *"My glass is empty"* complained Nobby. *"That's a good example of non-information,"* said Ali *"everyone here can see that it's empty, also the probability of the bottle being empty with you present is very high."* Jim took the hint and transferred another couple from the fridge.

"In addition to my dictionary researches" Jim continued *"I read an article about a bloke called Shannon who worked for the Bell telephone Laboratories in the mid forties; he quantified information and established the basis for the study of information theory. The theories are based on the simple observations made by Alf; if an event is certain it's information value is zero and the higher the probability the lower the information value. Using this concept he was able to develop techniques for maximising the amount of information in encoded transmissions such as teletype and data transmission systems."* *"Very interesting,"* said Ali *"I suppose the moral to that story for our benefit, is to keep the information value of our on air exchanges as high as possible and avoid redundancy."* *"I hate to interrupt,"* exclaimed Nobby *"but there's a fly in your beer Jim and he's just avoided being sucked in with your last gulp. Is that information?"* *"Your communication is received and understood"* said Jim emptying the remains onto the Geraniums.

"I like just talking to my friends on air" said George *"and they are the same. It's good to pass the time of day with friends you see only occasionally. It's all very well to advocate efficient communication; I can be an efficient communicator when I have to be but to me there is more to the hobby than that."* Everyone understood old George's point but secretly disagreed: George's turn on the club net was like the commercials on TV, time to put the coffee on or attend to calls of nature.

"Speaking of efficient communicators," said Jim *"here come the wives. Quick, get rid of half the empties."*

AR

QSP

MORE PRIVILEGES

As of 27th September 1985, Canadian amateurs are allowed to use CW and phone at the maximum legal power on the entire 160 metre band, 1.800-2.000MHz. Repeater use at 10 metres is also authorised. Also ATV with a 6MHz bandwidth is authorised, and SSTV operation no longer requires a special endorsement.

There is also word that there is a possibility of a Canadian Novice Licence, and a deregulation of mode sub-bands, which would allow Canadian amateurs to operate any mode, anywhere in their amateur allocation, relying only on voluntary adherence to recommended band plans.

Adapted from The ARRL Letter, 24th October 1985

SOLAR GEOPHYSICAL SUMMARY — September 1985

Solar activity was very low with no energetic flares observed. The solar disc was without spots for much of the month and this is reflected in the 10cm flux, which had a high of 72 and a low of 67. The monthly average, 69.5 was the lowest since the last solar minimum.

The persistently low flux values of recent months suggests that the solar minima can be earlier than previously estimated — as close as mid-1986.

10cm flux readings were 1-4=72; 5,6=71; 7=70; 8=69; 9=70; 10=69; 11,12=68; 13-16=70; 17=69; 18,19=70; 20-24=69; 25,26=68; 27=67; 28-30=68. Average was 69,5. The sunspot average was 3.9.

GEOMAGNETIC

14th September — The geomagnetic field was at storm levels 0600-1500UTC A=27.

16-17th September — The field was active on 16th and at minor storm level 1100-1300UTC. Unsettled on 17th with active levels 1000-1200UTC. A=25,16.

19th-21st September — The field was at storm level on 19th particularly between 0800-1300UTC and 1530-1730UTC. Active on 20th with disturbance ending around 1500UTC on 21st. A=28,21,18.

24-27th September — The field was generally at unsettled to active levels. A=15,18,17,17.

The quietest days were: 4=2 5=2 3,29=4 2,12,30=5.

Data courtesy ot the Department of Science IPS Radio and Space Services.

AR

VOA USES AMATEURS

When the catastrophic earthquake rumbled ashore from the depths of the Pacific Ocean off Acapulco, Mexico, toppling buildings and killing thousands in Mexico City, it also cut off the nation from the rest of the world.

All communication links snapped along with most of the city's electric and telephone.

In the Voice of America's Washington newsroom, as reports of the earthquake came in, Chief Assignment Editor Edie Apple tried to call VOA Correspondent Gary Tredway, in Mexico City, but the line was dead.

Ms Apple, a veteran correspondent, assigned Charge Editor, Andy Guthrie to make contact in anyway possible. Guthrie turned to the VOA maintenance engineers who operated the VOA amateur radio club station K3EKA. Three members of the club, Hugh KB3TB, Richard WA9VIV and Greg K9FL quickly turned a section of the work bench into a listening post.

Within minutes, the words "This is XE1VIC, go ahead with your traffic" were heard on the VOA receiver. The station of Victor Keller XE1VIC quickly became one of Mexico's few electronic links with the outside world. Broadcasting in both Spanish and English, Victor ably handled international traffic, relaying messages from the news media and anxious relatives about family members in the quake zone.

The VOA equipment, an FT-757 and scaled-down antenna system, were not reliable enough to consistently reach Victor, so it was necessary to use relay stations, WB6HVN, WA5PME, and KC3EK to pass urgent messages to Correspondent Tredway and Reporter Lucy Conger. The reporters were urged to make their way to any amateur's station so they may relay information of the earthquake to VOA's 24-hour news service. (It had been decided not to re-broadcast any amateur transmissions to conform with FCC regulations).

Eventually, Tredway and Conger were able to file a *report* via Carlos Arciniega XE1MT to Julian WA5PME, and the extent of the quake's damage was prepared for VOA transmission.

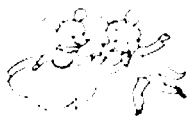
Plans are being studied to use the facility of K3EKA in future whenever regular communications are not available.

The Voice of America is the US Government's International Radio Broadcasting Agency, transmitting more than 1 300 hours of programming every day in English and 41 other languages, to an estimated audience of 110-million listeners, each week. A branch of the United States Information Agency, VOA first went to air in February 1942.

The program service broadcasts news on-the-hour, around the clock. The programming, which includes music and features about the United States, is designed to inform foreign audiences about America.

The VOA Radio Club (K3EKA) operates on an irregular schedule, as engineering duties permit. All amateurs that work the station receive a distinctive VOA QSL card. The QSL address is Hugh Katz VOA/BZ, VOA Radio Club, Room G-510B, The Voice of America HHS - North Building, 330 Independence Avenue, SW, Washington, DC. 20547.

Abridged from material supplied by Andy Guthrie, Charge Editor, Voice of America. AR



QSP

HELP WANTED

The VK5 Division is urgently in need of participating members. The prime need is for a volunteer to act as Programme Organiser for the Divisional Meetings. There are only four meetings left before the next Council election, so ***Can You Help?***

Members are also required to attend the monthly meetings. Meetings are held for the benefit of all members, so come along and participate in your Division.

From October's South Australian Journal

NOTICE

DEADLINE

All copy for inclusion in the March 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st January 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is *required by the Deadline* as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x220mm SASE to: **RJ & US IMPORTS,** Box 157, Mordale, NSW. 2223. (No enquiries at office ... 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Rozelle, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — ACT

TEN-TEC ARGONAUT TCVR: Realsitic price paid for quality rig. Write to R Jenkins VK1UE, QTHR, with details and price.

WANTED — NSW

MAGAZINES: Amateur Radio. I need the following issues — Aug & Dec 1934; Aug 1935; Sep 1938; Nov & Dec 1939; Jan-Mar 1940; Aug 1940 — Nov 1945; Jan-Nov 1946; Jan-Aug 1947; Nov-Dec 1954; Aug & Dec 1955; Oct 1956; Jan 1957-Nov 1963, most issues, Jan-Mar 1965; Feb 1967; Sep 1969; Mar, Aug & Dec 1977. Contact Brian VK2EFD, QTHR. Ph: (049) 77 2178.

SOCKETS: 2 for 4-1000A tube. Gordon VK2ALM. Ph: (065) 53 5353 after 5.30pm.

YAESU FT-790R: Or similar multi-mode 70cm tcvr. VK2EFA, QTHR. Ph: (080) 5285

WANTED — VIC

TELETYPE MODEL 14: Siemens and Creed Tape Distributers. Other equipment to suit these models. Colin Gracie, Cavendish Post Office. Ph: (055) 74 2319.

TEST EQUIPMENT: In good condition. HP-410B VTVM or Boonton 91H. Also HP411AR RF millivolt meter. Would consider other types of similar equipment. B Wilton VK3XV, QTHR. Ph: (03) 527 4029 — Reverse charge after 5pm.

WANTED — QLD

PHILIPS OR MULLARD TX ELECTRON TUBE HANDBOOK: Wanted urgently. Needs to show socket connections of double tetrode valves QQ and YL series. VK4EF, QTHR. Ph: (07) 38 1803 AH.

WANTED — NT

AN-PRC 9A OR 10 SET VHF TCVR: Trevor VK8CO, Box 40441, Casuarina, NT. 5792. Ph: (089) 27 9256 AH.

FOR SALE — NSW

CLOCK (24 HR) WORLD TIME: 10" quartz wall unit with brochure & instr. Never used. $40. Allan VK2FH, QTHR. Ph: (02) 969 8703.

COOK BOOK: The VK Amateur Radio Cook Book now on sale. Great value. 64 pages. $5 posted. VK2ZYE, PO Box 126S, South Wagga, NSW. 2650.

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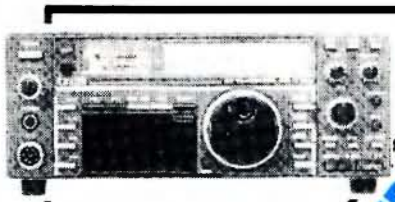

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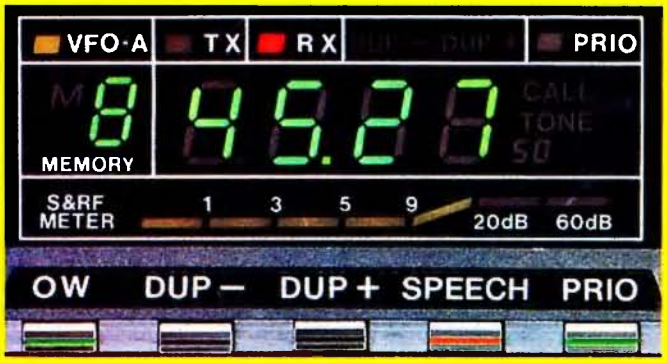

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Amateur Radio

VOL 54, No 2, FEBRUARY 1986

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VK1 wins the 1985 Remembrance Day Contest — full results this issue

Amateur Band Plans

Repeaters — the future

IARU Conference Report

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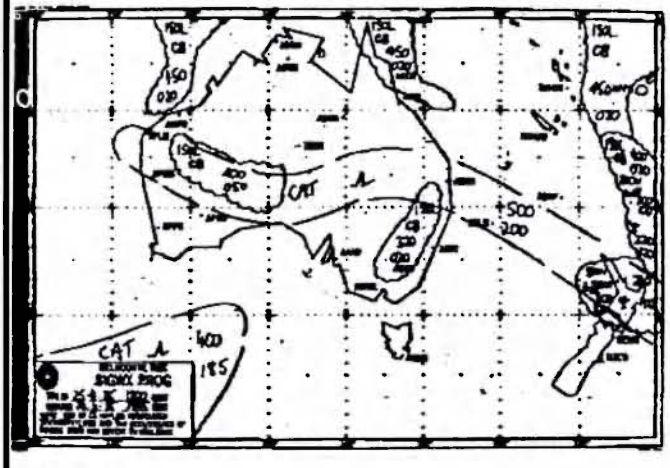
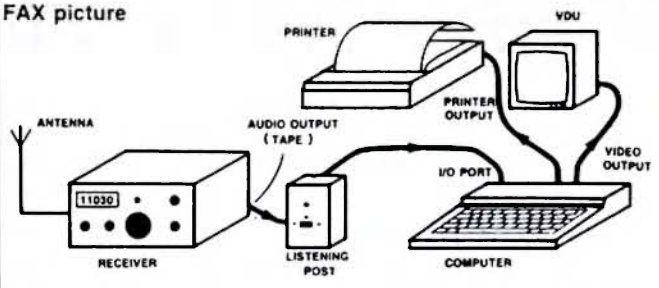


FAX picture



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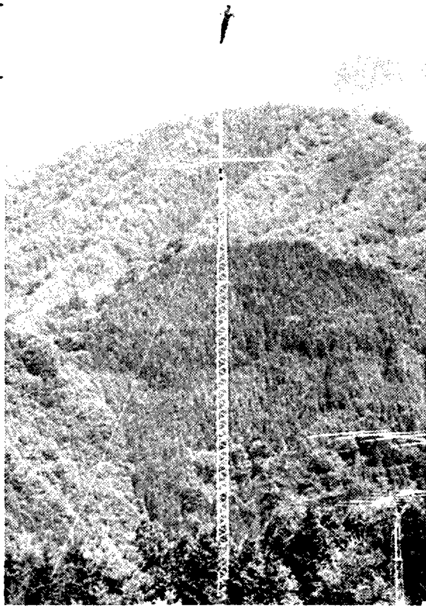

Photograph courtesy Graham VK8GB

Hide JA4MBM, on top of his "Mountain Top" antenna system. See VHF UHF — an expanding world, page 26 for full details

Technical Features

Special Features

Regular Features

This month's magazine contains the Amateur Radio Awards for the preceding year, (see p 31). These are awarded each year to encourage participation in Amateur Radio by members — will your name be included next year.

There is quite an amount of general information about the future directions of the hobby. Firstly, there is a brief summary of the IARU Conference, held in New Zealand, during November. This summary details some of the items which were decided, and many items which will be considered at future conferences.

Repeaters — the future, page 8, details repeaters generally, and indicates some of the steps the WIA proposes to take on various repeater issues.

Ron Henderson VK1RH, discusses Amateur Band Planning in two separate articles, page 20 and 22. Ron explains the definitions of and anticipated future of Band Planning.

The Remembrance Day Contest results are announced on page 40. Congratulations are in order for the VK1 Division, the winners for 1985. Also, in the contest pages, are the rules for this years John Moyle Memorial Field Day Contest. Remember to read them carefully.

This month we welcome a new Federal Awards Manager, Ken VK5AKH, to the columns of AR. Ken begins his column with an updated listing of the WAVKA Award.

BP K

DEADLINE

All copy for inclusion in the April 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st February 1986.

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Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162.** *by the* **22nd day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Watch the space below the index for deadline dates. Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgement may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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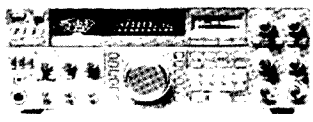

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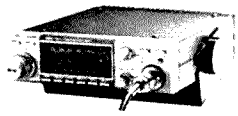

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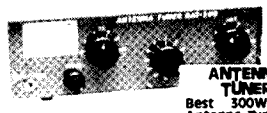

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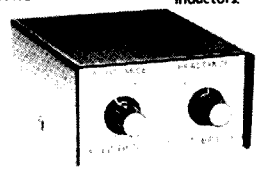

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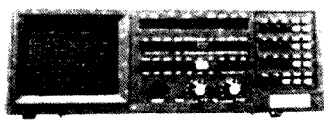

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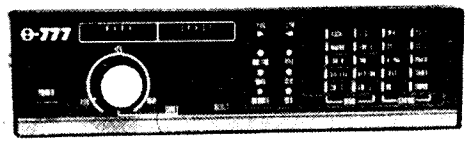

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Editor's Comment

MAINLY TECHNICAL

As recently mentioned, we hope to publish many more technical articles this year than we were able to in 1985. Those of you who feel impelled to write them are invited to start writing now. *We need your help!* But what kind of material should you, the author, be sending us to publish? What do you, the average reader, most want to know about?

We have had a few ideas fed back to us recently, particularly because of the queries about the future of amateur radio which have been raised over the last six months or so. There is an excellent discussion of that subject elsewhere in this issue. But it does seem that we need more articles aimed at the newcomer and the Novice. Construction articles, simple pieces of test equipment, or accessory items for the usual commercial transceivers. Antennas are always a popular subject, because most people can still build their own.

Don't worry if your article seems too elementary. We will tell you if it really is! On the other hand, many things which the older amateur takes for granted, *(everyone knows that!)* may be news to the newcomer, and perhaps just the missing pieces needed in the theoretical jigsaw he has struggled with for weeks. *Is there a generation gap?* If so, it may well cut both ways. There are thousands of young people out there who have cut their teeth on computers and to whom digital techniques are second nature. But to the older amateur, maybe quite at home with RF and linear circuits, this "newfangled digital technology is all black magic!" Here, surely, is an area where the young can teach the old.

But even though the future of the hobby inevitably involves more and more digital technology, may I sound a cautionary note. We have a need for more basic theory and hardware-oriented articles, rather than basic programs and simple software. Someone I was talking to recently is, for example, eagerly awaiting a "how to build it" article about a good stable VFO with digital frequency read-out. *Does anyone have one, ready to write up?* We have space ready and waiting to print it. *And how about some packet-mode hardware?*

Also in this issue we have another article on aircraft enhancement of VHF and UHF propagation. There are apparent divergences of opinion on this topic, which can only be resolved by more users getting into the SSB DX scene on two metres and 70cm. More stations, spread more widely, would show more clearly the dimensional extent of this fascinating phenomenon, which permits communication on a near-routine basis over distances many times farther than line-of-sight, without benefit of inversions, ducting or Sporadic-E. Here is a chance for the Amateur Service to add something to the fund of human knowledge, to be once again at the cutting edge, as amateurs always were in earlier years.

Have I thrown out enough challenges yet? I hope so. *Let us get into the action!*

Bill Rice VK3ABP
Editor
AR

NEWS FROM GREAT BRITAIN

NEWS FROM LONDON

50MHz for UK — The Department of Trade and Industry has announced an allocation of 50.000-50.500MHz for the amateur radio service, effective from 1st February 1986.

This follows an experimental period, begun in February 1983, when 40 special transmitting licences were issued to existing amateurs to use 50.000-52.000MHz for a program of experimentation and learning about propagation conditions in the band, followed by a further 60 licences issued in 1984.

At that time, UK 405 line television transmissions still existed in Band 1, and all amateur working took place outside normal broadcasting hours, using low power. All television transmissions ceased early last year, and following negotiations with the RSGB the DTI has finally agreed conditions for the new band, taking into account the continuing use of Band 1 by European broadcasting stations.

Restrictions have been imposed to minimise the risk of amateur transmissions interfering with established European services, but the DTI has agreed to review the use of the band after a year to see if the operating conditions can be revised.

The conditions from the first of this month are:

— the allocation shall be primary within the United Kingdom
— initially, only Class A licensees permitted access to the band
— maximum power at all times shall be — Carrier 14dBW (25 watts) ERP; PEP 20dBW (100 watts) ERP
— maximum transmitting antenna height to be 20 metres above ground level
— antennas shall be horizontally polarised
— no mobile, portable, or temporary premises operation will be allowed
— there will be no restriction on modes or hours of operation
— no repeaters will be allowed on the band
— existing permits will be withdrawn.

There has been some anticipation of the new allocation, since a preliminary statement was issued by DTI, last June. Several magazine articles have already appeared showing how to get on the new band in various ways, and a number of transceivers, transverters and linear amplifiers have arrived on the market.

With present propagation conditions, this does not seem to be the best time to embark on 50MHz, but a number of enthusiasts seem to be eagerly awaiting the "off", and it will be interesting to see how it all works out.

Contributed by AR's London Correspondent, Tony Smith G4FAI

RSGB TESTS MORSE

Britain's Department of Trade and Industry announced on 2nd December 1985, that it had appointed the Radio Society of Great Britain to take over the running of amateur radio Morse tests on its behalf from 1st April 1986.

British amateurs have two types of licence, Class B — VHF only, and Class A — all bands. The 12WPM Morse test, which is a pre-requisite of the Class A licence, was conducted for many years by the Post Office, and is currently administered by British Telecom. DTI invited new proposals for running the test from the RSGB, Telecom, and the City and Guilds of London Institute, the examining body for the radio amateur's examination.

The new arrangement includes a seven pound test fee, to be held at this level for two years, and the establishment of at least 70 testing centres, one in each county, region, or designated island. Tests will be held every two months in each centre.

There are currently 27 900 Class A, and 27 783 Class B amateurs in the UK.

Contributed by AR's London Correspondent Tony Smith G4FAI

SAINT DAVID'S DAY

The Saint David's Day Special Event Station will again be operational on the 1st March 1986 to celebrate the National Day of Wales.

The station will be operational from midnight Friday 28th February to midnight Saturday 1st March 1986. Activity, conditions permitting, will be on all the HF amateur bands.

A team of enthusiastic operators will be pleased to make contact, and as always, will endeavour to send greetings to as many countries as possible, world-wide.

The Special Event QSL card will be sent to all amateurs making contact with the SDD station. SWLs are also welcome to send reports.

All licensed operators interested in the attractive Saint David's Day Award should aim to meet the following requirements:

Contact should be made with the Special Event Station on Saint David's Day, 1st March, and five other Welsh Amateur Stations during the months of February and March 1986. To claim the Award, forward copies of logged contacts together with seven IRCs, to cover P&P, to — Event Co-ordinator, R R Jones GW4HOQ, 'Bryn-Ynys' 13 Strawberry Place, Morriston, Swansea, West Glam. SA6 7AG.

SOUND MAGNIFIED 1 000 TIMES

In the aftermath of an earthquake, rescue workers have an near impossible task — how to locate survivors buried beneath the rubble. In the Mexico City earthquake survivors were found days after the quake. G C S Communications Control Inc, manufacturers of sophisticated security equipment, have devised the BD-301, a device which amplifies sound up to 1 000 times. It can effectively allow rescue teams to hear sounds emerging from buried victims and thus pinpoint their location. These sounds would be absolutely impossible to detect with the unaided human ear.

This unit has been used by firefighters to determine life behind closed doors, and to detect fires within walls. It has also been used with success in mining cave-ins.

PROPAGATION VIA REFLECTIONS FROM AIRCRAFT

Gordon McDonald VK2ZAB
59 Wideview Road, Berowra Heights, NSW. 2082

In my article "Enhanced VHF/UHF Signal Levels due to Aircraft", (AR Oct 1985)[1] I explained how the phenomenon known as Aircraft Enhancement[2] could be accounted for by the known effects of passive reflectors. An essential point of my article was that it was a presentation of irrefutable mathematical truths derived from engineering texts. It was not theory. The technical editors of AR may have missed this point because they have subsequently published a contradictory article by Roger Harrison VK2ZTB[3] in which he expounds a theory which purports to explain the phenomenon. The Harrison article is scrutinised in this critique and some points, briefly mentioned in my previous article, are explained in greater detail.

Differing Opinions?

Giving reasons why he doesn't think that direct reflection from the aircraft is the cause of aircraft enhancement, Harrison states "There are widely differing opinions, even in the engineering texts, as to how to calculate the signal levels after reflection from the aircraft." (As a passive reflector.) Is this really the case?

I consulted several engineering texts and compared their formulas for passive reflector gain and path loss via passive reflector links with those given in my previous article, henceforth called "Aircraft Reflectors"[1]. Following is a summary of what I found:

a — Norton's[4] formula for the path loss on a two hop system using a passive reflector in the far field is:

$$Lp(dB) = 171.1 + 20 \log d_1 + 20 \log d_2 - \log a^2$$

The distance is measured in miles and a^2 is the effective area of the passive reflector in square feet. This is the same as in Aircraft Reflectors[1]. The formulas for effective area and passive reflector gain are the same as in Aircraft Reflectors[1]. b — The ITT Handbook[5] editors do not give a formula for path loss being content to simply refer to Norton[4], ie the same as in Aircraft Reflectors[1]. c — Contributors Jakes and Robertson[6] give the total transmission loss for a 'single mirror passive repeater' as:

$$(\text{Loss dB}) = 10 \log \frac{\lambda^4 d_1^2 d_2^2}{A_t a_t^2 AR}$$

AT, AR, and AI are the effective areas of the transmitting, receiving, and passive reflector antennas respectively and d_1 and d_2 are distances in the same units.

In Aircraft Reflectors[1] AT and AR are isotropic antennas so the effective areas of isotropic antennas must be used in order to compare the results. The effective area of an isotopic antenna is

$$\frac{\lambda 2}{4\pi}$$

When this adjustment is made, the results obtained with this formula are the same as given in Aircraft Reflectors[1].

d — Brodhage and Hormuth[7] give the path loss as:

$$Ap(dB) = 20 \log \frac{d_1 \times d_2 \times \lambda^2}{Sep \times Seu}$$

d_1 and d_2 are in metres, Seu is the reflector effective area and Sep is the effective area of the parabolic reflector used at the terminals. Substituting the effective area of isotropic antennas the formula becomes:

$$Ap(dB) = 20 \log \frac{d_1 \times d_2 \times 4\pi}{Seu\,(Aeff)}$$

This gives the same path losses as given in Aircraft Reflectors[1].

e — Freeman[8] says the path loss a is:

$$GT + GR + GA - a_1 - a_2.$$

Gs are transmitting, receiving and passive reflector antenna gains and a's are path losses, all in dB.

$$GA = 20 \log \frac{4\pi A \cos \propto}{\lambda^2}$$

(Passive Reflector Gain)

A is the reflector area (total) and $\propto$ is half the angle between incident and reflected waves. Watch the signs and you will get the same results as in Aircraft Reflectors[1].

f — Carl[9] states "The gain of an evenly illuminated flat reflector is the same as the gain of a dipole combination with reflector" and:

$$G(dB) = 10 \log \frac{4\pi A}{\lambda^2}$$

(A is Aeff)

Note that this is the one way gain, ie half that given in Aircraft Reflectors[1]. However he also states that the path loss F is:

$$F_1 + F_2 - 2G.$$ (Fs are the path losses)

So he uses G twice anyway. This gives the same results as in Aircraft Reflectors[1].

g — The formula for path loss used by the Lenkurt Electric Co Inc[10] gives the same results as in Aircraft Reflectors[1]. It is formula (27) on page 100 of their publication.

On page 99, referring to 'billboard' type metal reflectors the author states "With surfaces of adequate flatness it is close to 100 percent efficient, as compared to about 55 percent efficiency for antennas".

Furthermore, the passive reflector acts as both a receiving antenna and a retransmitting antenna, and it's 'gain' is therefore applied twice," ie the same as stated in Aircraft Reflectors[1].

h — What about Picquenard[11]? Harrison implies that his opinion, at least, differs. The truth is that Picquenard doesn't address the matter of radio links using passive reflectors at length.

However he does give a nomogram for path loss via a passive reflector. It is Figure 184 on page 287. The distance scale will cover the Canberra to Melbourne path and the passive reflector effective area scale, which he calculates in the same way as in Aircraft Reflectors[1], will cover the Aeff of a 747 at 37 000 feet half way between those two cities.

The path loss scale is a little short as it finishes at 200dB but an easy extrapolation will result in the same path loss as given in Aircraft Reflectors[1] for the conditions considered, ie approx 208dB.

The foregoing clearly indicates that Harrison's assertion about differing opinions is wrong. In fact, all authorities agree that the passive reflector has gain, they agree on how much gain a reflector of a given size has and as a result they all agree on the path loss to be expected from a given link with a passive reflector in it. Their methods differ slightly but the end results are invariably the same.

Furthermore Harrison's calculation of path loss between VK3UM and VK2ZAB is also wrong simply because it does not include the gain of the passive reflector.

The foregoing also clearly indicates that the methods used in Aircraft Reflectors[1] are correct for passive reflectors and also for aircraft because there is surely no doubt that the performance of a flat piece of metal as a reflector is not dependant on the nature of the supporting framework behind it even though this may the rest of an aeroplane.

Observations

Harrison's summary of reported observations contains several which require comment. Are they accurate? Are they reported in an unbiased manner? Let us examine a few of them:

a — "Signal level 'lift' observed is estimated to be 30-60dB." Signal level lift from what? Where is this observed? Is it the same everywhere? One thousand to one million times is a fair degree of uncertainty! It is difficult to imagihe this observation being of any use to anyone.

b — "Signal level lift and period of enhancement are dependant on upper-air wind conditions, etc".

This is not an observation; it is a conclusion. Is it couched in this manner because Harrison needs it to support his hot air theory?

In fact, all it amounts to is that Canberra amateurs claim that when aircraft enhancement is poor from them to Melbourne, aircraft report turbulence. It has not been clearly related to Sydney to Melbourne contacts and it is not clear whether or not turbulence is always reported when aircraft enhancement is always poor when turbulence is reported.

In any case signal conditions vary for a quite different reason and at best there is only a coincidental relationship to turbulence. This is explained in more detail in the next section of this article.

c — "Stations in Frankston (Melbourne) hear stations in Sydney some two to three minutes earlier than VK3UM, who is located about 40km closer to Sydney".

This is a misleading half truth. Whereas stations in Frankston have been observed to hear Sydney stations earlier than VK3UM hears them, the estimate of two or three minutes relates to how much earlier the Frankston stations hear Canberra[12] and the estimate was made early in the aircraft enhancement experiment when VK3UM was active on two metres rather than 70cm as he is

now.

In the case of Sydney stations, although they are heard in Frankston earlier than VK3UM, the time difference has not been clearly established.

VK3UM is located 40km closer to Sydney than Frankston, however he is also located about 16km north-west of a line between Frankston and Sydney and about 15km north-west of a line between Frankston and Canberra. Later in this article I will show that this is more significant than the 40km mentioned by Harrison.

d — "Backscatter propagation is noted between Canberra and Sydney stations ... This phenomenon is only noted during exceptional 'lift' conditions".

This needs to be clarified quite a lot. In fact at least two Canberra amateurs who regularly take part in aircraft enhancement contacts have been in the habit of referring to signals heard via the back of their beams as 'backscatter'. How can genuine 'backscatter' be correlated to 'exceptional lift conditions' under these circumstances?

In any case what exceptional lift conditions? Between Canberra and Melbourne? Both? Or between Sydney and Canberra perhaps?

In spite of these uncertainties, backscatter does occur and when it does doppler shift also occurs. The magnitude and direction of the doppler shift is consistent with back reflections from an aircraft retreating from both Sydney and Canberra, ie past Canberra on its way to Melbourne. Harrison does not mention this, probably because he didn't know about it. However, it does not help his hot air theory much either.

Incidentally, while on this subject, some amateurs have expressed concern about the lack of doppler shift on Sydney-Melbourne and Canberra-Melbourne contacts.

Doppler shift only occurs when there is a change of path length, transmitter to receiver. This happens in the backscatter case but does not happen, or strictly speaking, only happens marginally when the aircraft is near the terminals, during the Sydney- Melbourne and Canberra-Melbourne contacts. Hence there is no doppler shift on those paths.

e — "The size and type of aircraft seemingly has little bearing on the enhancement characteristics, etc".

This is simply not true. It would help the Harrison theory if it was, but it clearly is not. I know of no observers anywhere who would agree with this.

The signal levels are clearly proportional to the size and operating altitude of the aircraft. This has been confirmed many times over the Sydney-Melbourne and Canberra-Melbourne paths as well as in local reports of overseas observations, albeit somewhat sloppy observations[13].

Furthermore, dozens of aircraft enhancement contacts between VK2ZAB and VK4s AUR, AGQ, KJL, and others less frequently on 144.300MHz, together with some contacts between VK2ZAB and VK4AGQ on 432.300MHz have been made at signal levels consistent with the size of the aircraft operating between Brisbane and Sydney at the times when the contacts were made.

The facts are clearly consistent with the path loss and signal level calculations made on the basis of the aircraft as a passive reflector as set out in Aircraft Reflectors[1]. Harrison's summary of observations is clearly biased toward his hot air theory. The omission of the doppler shift in the backscatter observation and the false suggestion that the aircraft size is unimportant, together with the lack of comment on operating altitude clearly show this bias.

However, why does the enhancement mode fail sometimes and what is this about the footprint moving backwards? Let us examine these matters further.

Radar Holes[14]

In Aircraft Reflections[1] I drew attention to the fact that anomalous propagation, other than aircraft enhancement, occurs at some time almost every day[15]

When a group of amateurs are participating in regular scheduled operations, as the aircraft enhancement fraternity are, the laws of chance dictate that other forms of anomalous propagation must sometimes coincide with the aircraft enhancement time slot.

Tropospheric temperature inversions occur frequently causing super-refraction of radio waves and tropospheric ducts[14]. This should be well-known to all VHF/UHF enthusiasts because it gives rise to enhanced signal levels at distant locations and hence 'troppo' contacts.

When ducts coincide with aircraft enhancement schedules it may be thought that the combination would result in even bigger and better signals and indeed sometimes it does. My first 70cm contact with Angus VK4AGQ, in Brisbane, was undoubtedly aircraft assisted troppo.

However, perhaps more frequently than not, the coincidence of ducts and aircraft results in poor aircraft enhancement signal levels.

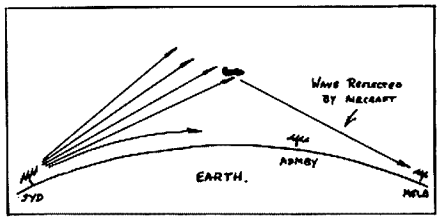


Figure 1a — Normal Aircraft Enhancement Situation. Note: Some low angle waves refracted in normal troposphere provide contact between Sydney and Adaminaby.

Consider Figure 1a: This is the normal aircraft enhancement situation. The signals in Melbourne and Sydney are enhanced by reflection from the aircraft and the signals from Adaminaby are normal in Sydney. There is no duct.

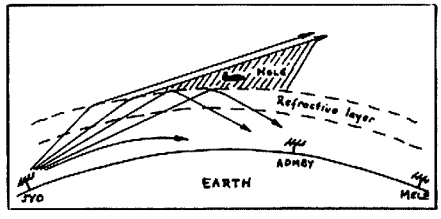
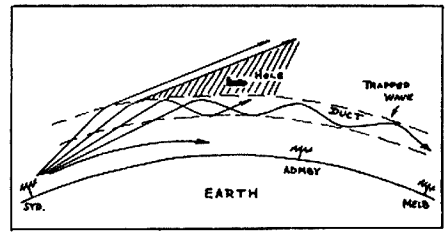


Figure 1b — Aircraft Enhancement Sydney to Melbourne is poor because Aircraft does not intercept signal from Sydney. However, Sydney to Adaminaby signals are good.

In Figure 1b a refraction layer of air caused by a temperature inversion has formed and the aircraft is above it. This results in a decrease in the power density available at the aircraft and aircraft enhancement signals are poor. Signals from Adaminaby are good in Sydney.

In Figure 1c the degree of inversion is such that a duct has formed and the signal has become 'trapped' in the duct. Aircraft enhancement signals are poor. Signals from Adaminaby are normal in Sydney.

The reduction in power density at the aircraft also results in a reduction inthe level of the back-scattered signal so the aircraft may disappear off radar screens. The aircraft is said to be in a 'hole'. It is a well-known and understood phenomenon.



Duct traps wave so that Sydney to Adaminaby signals are back to normal but still no Aircraft Enhancement Sydney to Melbourne.

It is clear that this mechanism is a more likely cause of reduced aircraft enhancement signals than having the hot air blown away in the wind.

Nevertheless, it may be that the meteorological conditions, which give rise to ducts, also give rise to turbulence, as reported by the aircraft, so the observations made by Canberra amateurs may be, coincidentally, valid.

There are diurnal and seasonal variations in the prevalence of inversions so there will also be diurnal and seasonal variations in their coincidence with aircraft enhancement conditions.

Path Geometry and Footprints

Harrison says that: a — The fact that Sydney (or Canberra) stations are heard in Frankston before they are heard at Chirnside Park (VK3UM) indicates that the signal footprint on the ground moves backwards, ie towards the aircraft; and b — That direct reflection from the aircraft would require that the footprint moved forward at twice the speed of the aircraft. Thus, he says, the two are contradictory.

This is nonsense. Proposition a is wrong, proposition b is irrelevant and the contradiction would only apply in a one dimensional world.

The signal footprint on the ground is in the form of a long ellipse modified by terrain irregularities. The long axis of the ellipse lies along the continuation of a line joining the transmitting station with the reflecting aircraft. This pattern may be simulated with a torch (flashlight) resting on the floor of a darkened room so that its beam is at a slight positive angle to the floor, ie the floor is not directly illuminated but the circle of light falls on a wall about 500mm up from the floor and say four metres from the torch.

Now hold a small (75-100mm diameter) mirror face down and parallel to the floor. Lower it into the beam 300 to 400mm in front of the torch and observe the pattern of illumination on the floor.

The shape of the mirror will change the pattern somewhat, as will the shape of the aircraft change the footprint. However, our purpose will be served without considering the complexities introduced by this factor or diffraction effects at the edges, departures from flatness or the earth's curvature. The footprint will be generally elliptical with the long axis along the signal path.

Now consider Figure 2. This illustrates the general case encountered in practice. The flight path of the aircraft crosses the signal paths from transmitter to receivers at an angle.

The signal footprint illuminates receiving site 'A' at a medium distance from the transmitter, it then illuminates site 'B' somewhat further away from the transmitter and then sites 'C' and 'D' simultaneously even though 'C' is closer to the transmitter than 'B' and 'D' is further from it.

The time between illumination of successive sites depends upon the speed of the aircraft, the location of the receiving sites relative to the transmitter and the angle the flight path makes to the signal paths.

The case cited by Harrison where the whole signal footprint moves forward at twice the speed of the aircraft, requires the flight path to coincide with the signal path from the transmitter to each observing receiver. This situation would be rarely encountered in practice and doesn't apply to the Sydney or Canberra to Melbourne situation.

Note also that the footprint never moves backwards.

Still referring to Figure 2, consider the transmitter is located at Canberra and receiver B and C are at Frankston and Chirnside Park respectively. The length of time between illumination of these two sites will be that time taken for the aircraft to get from point X to point Y.

I plotted the site locations and signal paths on radio navigation chart AUS RNC 2, available from the Department of Aviation, along with the flight path of large aircraft such as 747s, which leave Sydney on a noise abatement heading which takes them east over Botany Heads to a point, about 13km from the coast, where they turn right and track directly for Eildon Weir. This track takes them between trunk routes which leave Sydney on headings of 195 and 220 degrees (magnetic) and which may be used by domestic aircraft not equipped with inertial navigation systems.

Assuming a nominal speed of 850km/h the aircraft will cover the 33.36km from point X to point Y in 2.35 minutes. This is the time between signal 'peaks' at Frankston and Chirnside Park (VK3UM) for that aircraft reflecting a signal from Canberra. For signals originating at Berowra Heights (VK2ZAB) the geometry is different, points X and Y are 80.61km apart and the time difference is 5.69 minutes for a 747 on that flight path.

These are nominal acquisition time differences only because factors which will result in small variations in acquisition times have not been taken into account. These include terrain factors, differences in Lar, the space loss via the aircraft reflector[1], and differences in receiver thresholds at the two sites.

Signal Strengths

Harrison observes that amateur 'S-meter' reports are meaningless, and I agree with him, but he then goes on to take them more or less at face value. Furthermore, his suggestion that says VK1BG's signal on 432MHz can traverse the gap between Canberra and Melbourne, be backscattered from the ground, traverse the gap between Melbourne and Sydney and then retain such power that I can receive it at readable level, all with the aid of a ball of hot air, is simply mind boggling.

Nevertheless, I have been told that amateurs, particularly some located in Melbourne, have difficulty accepting the signal levels predicted in Aircraft Reflectors[1] because their 'S-meters' indicate higher levels at times.

I am still inclined to the view that this is primarily due to bad calibrations and that if I had said that say -105dBm was equal to 10dB over S9 instead of the IARU standard S7, there would have been no problem. There is also some evidence to indicate that the aircraft enhancement fraternity does not take into account phenomena like elevated ducts and temperature inversions which may reduce the path loss from the aircraft to the terminal sites under some circumstances.

There is no doubt that the signal levels received due to aircraft enhancement on its own is determined by the transmitted power, transmitting aerial gain, receiver aerial gain, cable losses and the path loss with the aircraft as a passive reflector. It may be that this last factor is not properly understood.

The formula for the path loss via an aircraft reflector is:

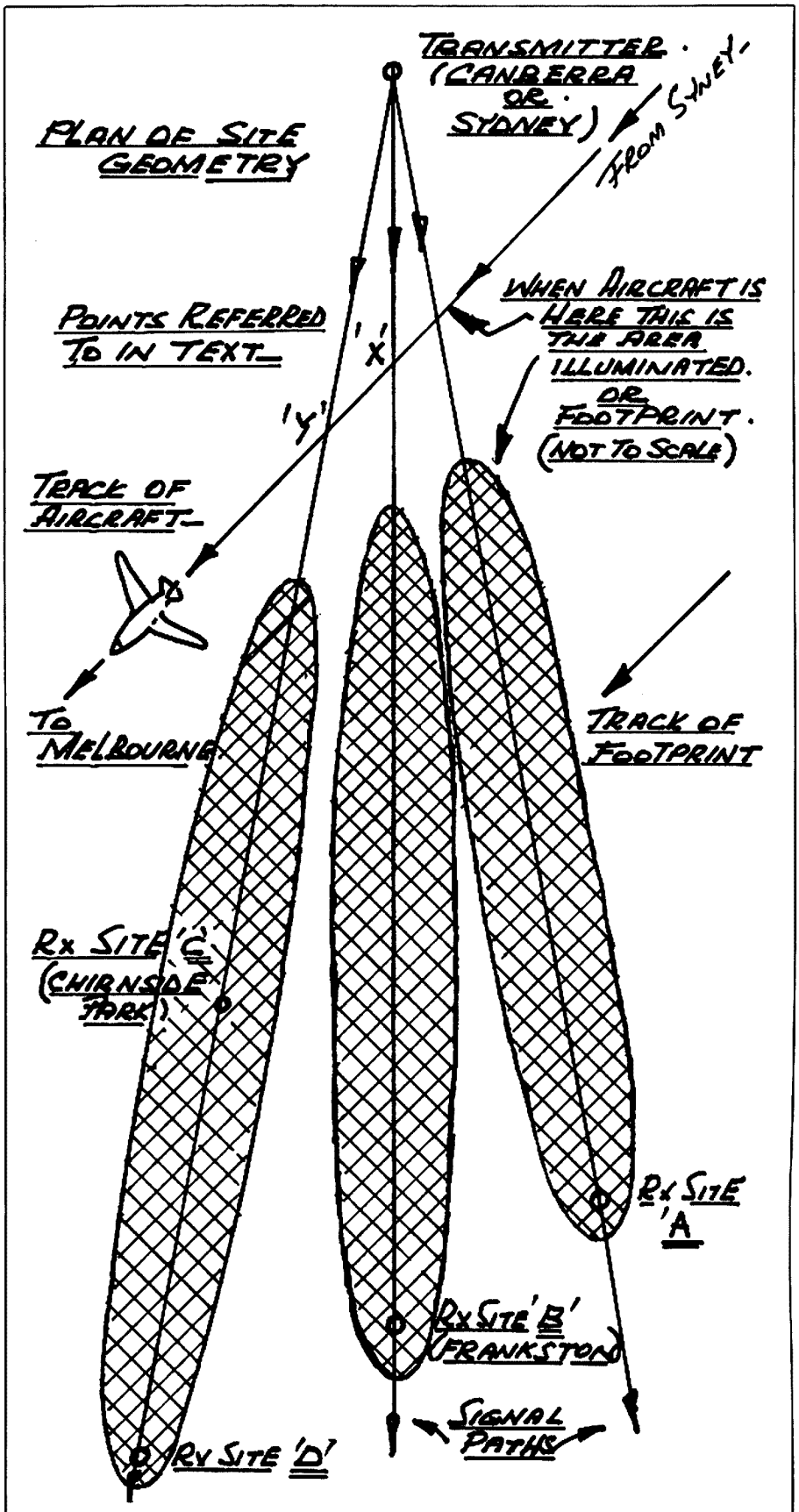


Figure 2 — Plan of Site Geometry.

$Lar(dB) = 141.98 + 20 \log d_1 + 20 \log d_2 - 20 \log Aeff$[1]

Where d_1 and d_2 are the distances in km from the terminal sites to the aircraft and Aeff is the effective area of the aircraft reflector in square metres. For a flat sheet:

$Aeff = A \sin \theta$

Where A is the reflector area in square metres and θ is the angle of incidence of the signal.

Consider the following:

a — Obviously, if the distances decreases the path loss will decrease. Signals from Canberra are stronger in Melbourne than signals from Sydney.

b — The examples given in Aircraft Reflectors[1] assume $d_1 = d_2$. If d_1 does not equal d_2 the path loss will decrease. The 747 on track for Eildon Weir crosses the Canberra to Frankston line much closer to Canberra than to Frankston. Therefore, provided it isn't counteracted by any other factor, the signal from Canberra will be about 5.5dB or one 'S' point better in Frankston than that indicated in Aircraft Reflectors[1].

c — If the aircraft flies higher than the nominal altitudes given in Aircraft Reflectors[1] θ will increase, Aeff will increase and the loss will decrease, but not by much. Work it out for yourself.

d — In Aircraft Reflectors[1] the examples of signal levels were based on aircraft as reflectors equivalent in area to the aircraft's wings. This is the only uncertain parameter in the formula.

Obviously bigger aircraft are bigger reflectors and cause lower path losses but is the area 'A' of a given aircraft equivalent to a flat sheet of the same area as its wings?

Persistent claims by amateurs who claim to have properly calibrated 'S-meters' indicate that the signal levels might be slightly higher than those given in the Aircraft Reflectors[1] examples.

Furthermore theory indicates that the forward scatter cross section of even a sphere is greater than the backscatter cross section[16], so it may be that parts of the aircraft other than the flat undersides contribute to the equivalent area and hence to Aeff resulting in a reduction in path loss beyond that given in the Aircraft Reflections[1] examples.

Nevertheless, even if the equivalent flat sheet area of the aircraft is twice that assumed in Aircraft Reflectors[1], the path loss will be reduced by no more than 6dB or one 'S' point on the examples given.

History

Reflecting objects such as ships and aircraft have been causing enhanced signal levels at receivers a considerable distance from the transmitter for almost as long as radio has existed. Reflections from aircraft were recorded in 1931 and a series of experiments were carried out, using among other things, a Ford trimotor and a transmitter on about 72MHz.

These early observations led to a system for the radio detection of ships using 'wave interference' equipment which later became known as "Bistatic Radar"[16].

Bistatic Radar uses transmitters and receivers a considerable distance apart (comparable to the target range) instead of at the same location (Monostatic Radar).

The system had disadvantages which caused it to be dropped in favour of Monostatic Radar, but not before it had been noted that one of its advantages was the dramatic increase in signal level which obtained when the transmitter, target and receiver were all in line (180 degrees Scattering Angle).

The system was investigated again in 1955, but again shelved.

The point is that "Aircraft Enhancement" is Bistatic Radar. It is not new. The system parameters were worked out long ago and it all happened before the jet age. There is not much of a ball of hot air behind a ship or a Ford trimotor.

Conclusion

The Harrison article has been shown to be inaccurate, misleading and illogical. The enhanced signal levels, due to aircraft, are caused by reflection from the aircraft itself. Harrison's article fails to provide an alternative to this historical, well-documented, engineering fact.

NOTE: The forgoing arguments are clear and convincing, but do not eliminate the possibility of a hot air refraction mechanism also taking place. Clarification of the debate as to the relative magnitudes of reflection and refraction can only occur with the provision of much more carefully recorded data, particularly as regards absolute signal levels. Go to it, chaps! — Ed.

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AR

TRY THIS

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DIPOLE FORMULA

Putting up a dipole is probably a project undertaken by most radio amateurs at one time or another, but getting them to work is something else.

Text books give a formula for calculating the length of a dipole in feet as 468/frequency in MHz, but this doesn't do the trick according to Des VK3DES and Bill VK3DXE — who operate portable from Enochs Point, in Victoria.

They cut a dipole for 14.2MHz one weekend using the above formula, and found it was too long.

Cutting and trimming it back using an SWR meter they finished with a shorter length of wire, which gave good results.

Dividing the length back, a new formula giving the length in metres as 138/frequency in MHz was found, and applying this to an 80 metre dipole, and then other bands, it worked out perfectly.

Des said that while the usual formula may work over a perfect ground plane or at a greater height, the 138 formula worked perfectly at a height of 4.5 to 7.5 metres above ground and no balun was needed.

At Enochs Point they use a combination 80 metre dipole and 40 metre inverted Vee, both cut to the 138 formula, without balun, and jointly feed with 50 ohm coax, which gives a 1:1.2 SWR.

The 40 metre inverted Vee has an apex angle of 120 degrees. The insulator is a toothbrush handle and ordinary PVC coated building wire is used.

Technical Editor's Note — Length formulae for dipoles are considerably affected by closeness to ground and wire sizes. Consequently they only serve as a starting point for adjustment. The formulae have been metric converted.

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YOUTH RADIO

One of the latest amateur radio stations in China is BY1SK, located at the Xuanwu Youth Technical Centre, in Beijing.

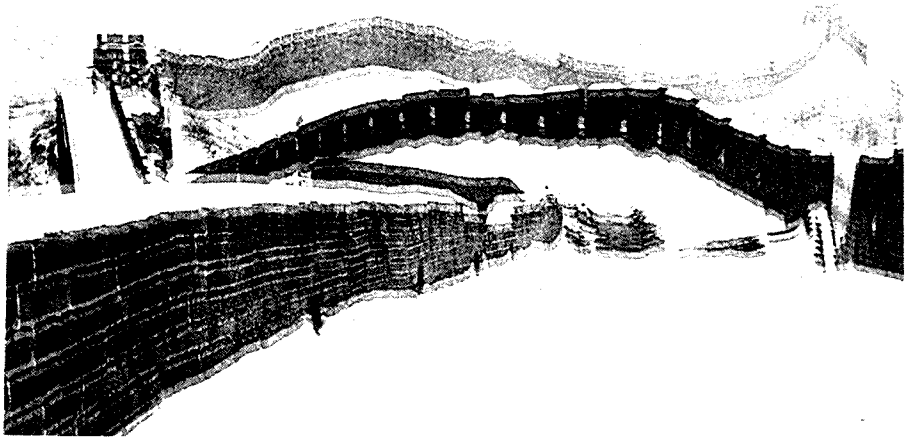
The Centre, which was set-up three years ago, is an after-hours institute where about 1 000 students pursue subjects in extra- curricular classes ranging from oceanography to model ship-building.

One BY1SK operator is 13-year-old Zhou Ti, a sixth grade pupil. He spends two to three afternoons a week at the centre and has a good on-air operating technique.

BY1SK uses a TR-7 transceiver on CW and SSB, often between 0600 and 0930UTC.

About 50 students at the centre, aged between 10 and 18 years, are interested in amateur radio and shortwave listening.

QSL information for BY1SK is — *Amateur Radio Station of Youngster Xuanwu District, PO Box 2916, Beijing, China.*



REPEATERS - THE FUTURE

Repeaters were first introduced into Australia in 1969. The history of this very successful form of amateur radio activity was detailed in a series of articles by Tim Mills VK2ZTM, and published in the March to June 1985 issues of Amateur Radio. In recent times repeater activities have been subjected to a variety of pressures. This article details some of these pressures and indicates the steps that the Wireless Institute is proposing to take on various repeater issues.

Peter Gamble VK3YRP
CHAIRMAN, FEDERAL TECHNICAL ADVISORY COMMITTEE

INTRODUCTION

Some of the pressures on repeater activities are obvious. In the more populated states, as more groups seek to gain licences for voice and special mode repeaters (such as RTTY and Packet) there is pressure on the increasingly crowded band space allocated to repeaters. Other pressures come from interference problems, as some repeater channels become difficult to use due to the high levels of RF found on the choicest sites. Still other pressures come from the regulating authority, the Department of Communications, as they seek to regulate this amateur activity.

In September 1984, the DOC published a discussion paper entitled 'Review of Amateur Terrestrial Repeaters'. This paper was circulated by the Federal Executive of the Wireless Institute to the Divisions. The Federal Technical Advisory Committee (FTAC) also examined the paper and co-ordinated the replies. Some of the issues raised in the paper where accepted by the majority of amateurs as being reasonable, while other issues were rejected. While discussing these comments with the DOC, they requested that a paper be prepared outlining the WIA views on repeaters.

At the same time, Packet Radio was emerging as a new communications process and the DOC indicated that the WIA should make a submission on this topic also. There was obviously a link between these papers, as one of the network elements that the packet radio experimenters wanted to introduce were repeaters. However, these repeaters were not the traditional type of voice repeaters consisting of a receiver and transmitter, but devices that included the computer processing power to handle the packet protocols.

To cope with these requests from the DOC in a manner that would ensure that all of the WIA Divisions had an input into this policy formulation process, FTAC was reorganised at the 1985 Federal Convention. While the aim of this Committee was the same as before, that is 'to advise the Federal Executive on all technical matters appertaining to amateur radio and to manage the RF spectrum as directed by the executive', its method of working has changed.

The Committee consists of a chairman and various expert members, together with a representative from each state. It was envisaged that liaison would take place between the Federal Committee and the various state technical Committees that exist, thus ensuring the widest spread of input to the technical policy making process. Reports prepared by FTAC would first be circulated within the Committee. Following any comments and discussion they would then be circulated to the Federal Executive, Divisions and State Technical Advisory Committees, who would consider the matter in conjunction with appropriate specialist user groups.

Since this process started, two papers have been drafted. The first deals with repeaters and the second deals with packet radio. These papers have been circulated within the Committee, comments received and amendments made. This article will outline some of the issues raised in the repeater paper, and a further article next month will discuss a number of aspects of packet radio. These papers are similar in that they conclude with a number of recommendations which will be put to the 1986 Federal Convention and, if accepted as WIA policy, will be presented to the DOC.

THE DOC DISCUSSION PAPER

The Discussion Paper 'Review of Amateur Terrestrial Repeaters' starts by noting that repeater stations may be considered an enhancement of the value of the Amateur Service. Further, they expect the popularity of repeater communications to increase as amateurs use their innovative skills to design and plan new systems. The paper continues *"Such activity should be encouraged, however it is essential that guidelines be formulated to permit an orderly progression of the service. It is of course impossible to fully predict the eventual products of the amateur's imaginative application of the electronic radio arts and accordingly such guidelines should be flexible to permit expansion and encompass future technological advancements."*

There is then a need to clarify the use of repeater stations. While a voice repeater may be primarily designed to enhance the range of communication for a mobile station, the same does not apply to an ATV repeater! The DOC also notes that conflict has, on occasions, resulted in the department having to arbitrate on what could be regarded as an internal amateur matter. Thus, co-ordination through a single body would be an advantage.

The paper then goes on to talk about the criteria for the consideration of applications for new repeater systems. These include the site and coverage of a new installation, significant reasons for the establishment of an additional repeater covering the same area as an existing system, and spectrum conservation aspects.

Another significant matter raised is that of equipment standards. This is related to the problem of interference, especially where the interference is due to another installation, but the amateur installation ends up being closed down. *"Should amateur repeater standards be adopted, commensurate to commercial specifications such a restrictive provision may no longer be necessary"* the paper continues.

The remainder of the paper considers the issue of cross-linking repeaters. Some of the applications received are noted, and some reasons for the requests listed. The paper then lists a number of things which are to be taken into consideration when a cross-linking proposal is received.

The paper concludes with some recommendations that include:

* *Cross-linking should only be permitted within the same amateur band*
* *The 1240 — 1300 MHz band may be best suited for link frequencies*
* *Cross linking of voice repeaters may be authorised provided that the extended coverage does not provide access to stations located within the bounds of capital cities, a demonstrated need exists, and no more than two repeaters are to be linked.*

THE WIA RESPONSE

It can be seen from the above that there are a number of items of concern to amateurs. Some of these were flagged quite early in the review process as it became apparent that the DOC were applying some commercial standards to amateur radio that were not warranted.

The WIA Discussion Paper 'Review of Amateur Radio Service Terrestrial Repeaters' starts by providing some background on repeaters including some of their typical uses. The new regulations, which came into force in August 1984, are then reviewed. The paper then goes on to consider some of the implications of these regulations. The following paragraphs are paraphrased from the WIA paper.

THE NEW REGULATIONS

The following paragraphs examine the new regulations in some detail and compare them with the Amateur Service aim of experimentation and self-regulation and with current amateur practice.

Repeater Station Licensees

The Wireless Institute believes that licences for the operation of a repeater station should only be granted to a group of amateurs, as has been past practice, and not to individuals. Further, a repeater should be considered as a community resource, and thus available to all amateurs, irrespective of their membership of any club or organisation.

Use of Repeater Stations

Paragraph 4.13 of the Regulations makes two comments on the use of repeaters that require examination. The first is that approval of the repeater/translator will depend on 'the requirements of that particular area'. There does not appear to be any elaboration of this requirement. It may at first be construed as relating to the allocation of operating frequencies, in which case there can be a valid reason for ensuring that it complies with the appropriate agreed band plan, and also ensuring a reasonable geographic spread of stations operating on the same frequency.

However, it could also be construed as applying to the 'needs' of the particular area. The corollary of this interpretation is that the Licensing Authority (the Department of Communications) could then be required to make a valued judgment as to whether another repeater was needed. For example, does a major capital city with seven existing two metre voice repeaters need another one? Does a country town with one existing lightly used repeater need a second one?

The Wireless Institute believes that the justification or need for a repeater is a matter for the Amateur Service to determine and not a matter for a value judgment by the Licensing Authority.

The second point of concern, from paragraph 4.13, is the intention that repeaters shall not be used for long distance communications. While the initial aim of repeaters was the extension of the communication range of VHF and UHF mobile stations, they now have a variety of uses and support various modes of communication. Thus, rules for the efficient use of a voice repeater may be quite inappropriate for an amateur television or packet radio repeater.

Guidelines for the use of various types of repeaters have been published from time to time by the Wireless Institute and it is considered that this is the most appropriate method for handling these matters.

License Application Requirements

Paragraph 4.14 of the Regulations provides for the method of applying for a repeater/translator license. One problem in this area that has occurred on a couple of occasions is the co-ordination of frequency allocations. These have generally related to repeaters adjacent to state

borders, where two, or more, states need to consider the implications of a particular proposed installation.

While the Wireless Institute has no objection to the Licensing Authority considering these matters, it believes that in the first instance these matters should be considered by the Wireless Institute. This does not imply that the Institute wishes to 'take over' all of the repeaters, but to co-ordinate the many diverse groups which construct and operate repeaters.

The Amateur Service is an experimental service and repeaters are paid for by amateurs themselves. The requirements of amateurs for communication are many and varied, and the Wireless Institute believes that the 'need' for a repeater is best judged by the Amateur Service and not the Licensing Authority.

Equipment Requirements

The technology used in repeater stations has undergone significant changes since repeaters were first introduced. This is evident not only in the radio frequency circuits, where advantage is being taken of the improved performance with state-of-the- art devices, but also in the use of micro-processor control circuits. The Wireless Institute believes that this flexibility to use the latest proven techniques is fundamental to the amateur's ability to experiment.

Paragraph 5.11 (e) refers to the need to automatically shut-down the transmitter of a repeater on receipt of an uninterrupted incoming signal exceeding a specified time limit. While there is no objection in principle to this requirement, difficulties exist in specifying an appropriate time limit. For instance, the time out on a Packet Radio repeater would need to be considerably shorter than that for an ATV repeater. Also, the time out requirements for a busy capital city repeater may be more stringent than those for a quiet country repeater. To avoid amending this paragraph each time a new mode repeater is introduced it would be better for the specified time to be left open, and a range of times be agreed as necessary between the Licensing Authority and the Wireless Institute.

The need for repeaters to identify themselves is covered in paragraph 5.11 (g). A variety of techniques are listed, with a view to ensuring that the repeater identification can be recognised by appropriately skilled and equipped operators. It is believed that broad guidelines only should be laid down, and that the repeater licensee be free to determine the most suitable and acceptable method. For instance, voice identification should be permitted for voice repeaters, ASCII identification for ASCII repeaters, and so on.

While recognising the responsibility to use the whole of the radio frequency spectrum in a responsible way, it must be remembered that repeater operators do not always have access to the latest commercially available test and measurement equipment. Thus, to impose the same technical standards on amateur equipment, as are imposed on commercial equipment, may result in insurmountable difficulties being placed in the way of some repeater licensees.

Accordingly, the Wireless Institute expresses some reservations about the paragraph describing the construction of a repeater (5.11 (b)) as being of 'high standard and in accordance with good engineering practice'. While this is a desirable aim, *how will it be judged?* For this to be done fairly and impartially, a set of standards would be needed. Use of commercial standards may pose difficulties in the light of the comments in the previous paragraph.

The Wireless Institute has no desire to see equipment with poor constructional or operational characteristics licensed for the amateur service, but believes that the points raised in the preceding paragraphs should be further discussed with the Department of Communications.

Operation on a non-interference basis

Amateur repeater stations have on occasions been required to be turned off when interference has been caused to them from nearby commercial equipment. Paragraph 5.11 (l) of the Regulations makes it clear any interference to amateur repeaters from other services shall be accepted, except where the interfering equipment is not operating in accordance with Departmental specifications. Determining the origin and cause of interference to any radiocommunication service can be a time consuming process, especially on a site where many organisations provide varied services.

It is obvious that the reason behind this situation is the observation that amateur repeaters are built to a variety of unspecified 'standards' while commercial equipment is required to meet specified standards. It may be possible, therefore, if amateur equipment was to be subjected to testing against the commercial standards that the approach by the Department of Communications on interference could be varied.

However, the point made in the previous section, that very few amateurs have access to the test equipment necessary to make these measurements, is still valid. Accordingly, it is recommended that the issue of compliance with commercial standards for amateur equipment be discussed further with the Department of Communications on the basis that it be voluntary as far as the Amateur service is concerned, and that having been shown to comply with the standards, a repeater be exempted from the restrictive requirements of paragraph 5.11 (l).

Thus, the Wireless Institute or a repeater group could arrange for a specific repeater to be subjected to the necessary testing procedure, and when shown to comply, be subject to a variation in the regulations. It is considered that repeaters located on prime sites serving large population centres would be the likely candidates for this procedure.

Use of specialised access control techniques

Various techniques are available to control the access to repeaters. These include tone-burst, sub-audible control tones and tone squelch, techniques which are frequently used in commercial installations.

These techniques are usually used to minimise interference from spurious signals on the repeater input frequency, and to quieten receiver output until a desired signal is received. While these techniques are no doubt appropriate in a commercial environment, the Wireless Institute believes that use of these techniques should be left to the discretion of amateurs.

Multi-mode repeaters

Multi-mode repeaters represent an efficient use of repeater hardware and the frequency spectrum. There should, therefore, be support for such devices where the modes are considered compatible.

CROSS LINKING OF AMATEUR REPEATERS

As indicated in the opening section of this paper, repeaters are an enhancement of the amateur service. There are many ways that this enhancement can be achieved — by using new technologies and new modes, and by expanding considerably the service area of an existing repeater. A typical example of the last point is the expansion of the amateur satellite service where VHF/UHF contacts to countries halfway round the world are now possible.

The Present Situation

One technique for expanding the service area of a repeater is to link it to another repeater. This could be done for a variety of reasons — to carry a news broadcast to more listeners, or to provide coverage from an isolated country area back to a neighbouring town or city, or to link a population centre with its nearby recreational area.

Approval has been given by the Department of Communications for three particular instances of cross linking on a trial basis. These are:

** Tasmania — link to relay WIA broadcasts,*

** South Australia — link city and country ATV activities, and*

** Western Australia — link city and country voice repeaters where the country repeater serves an isolated stretch of highway north of Perth.*

General Guidelines for Repeater Cross-Linking

The Wireless Institute believes that cross-linking of repeaters should be supported provided that certain conditions are met. The reason for the cross-linking should be consistent with the aim of enhancing the Amateur Service.

The following points are offered as guidelines for the licensing of linked repeaters irrespective of mode:

(a) Each repeater in the linked group is to be licensed individually according to the normal repeater licensing requirements. The cross-linking is to be the subject of a separate application. Further, approval in principle may be sought for any or all of the applications.

(b) Cross-linking of repeaters will not be permitted where such an arrangement allows an amateur to originate a signal on a band he is not normally permitted to use.

(c) Cross-linking may be either permanent, where all transmissions are cross-linked, or temporary for specific purposes, where only WIA news broadcasts or WICEN activities are cross-linked. If the cross-linking is for a temporary specific purpose, then it may be appropriate to modify some of the following conditions as indicated.

(d) The traffic and interconnecting signals for permanent cross-linking of repeaters are not to be carried in the same amateur band. While it is preferred that this band be a higher frequency band, it is noted that propagation characteristics of a particular location may require the linking to be done on a lower VHF/UHF band. Further, the link frequencies used must be in accordance with an approved Wireless Institute Band Plan.

Cross-linking of repeaters for a temporary specific purpose; eg a Wireless Institute Broadcast, will be permitted to use 'off- air' signals for input.

(e) Where the cross-linked repeaters are in different states, then approval of all the relevant WIA Divisions is required.

(f) The maximum number of repeaters to be cross-linked where simultaneous emission is used shall be three. Where the received traffic is stored before retransmission, eg in RTTY or Packet mode operations, or where repeaters may be selectively added to the link, then this limit does not apply.

(g) All ATV repeaters and links shall use vestigial side band emissions only for picture signals.

It is noted that further mode specific conditions may need to be applied from time to time to overcome difficulties that are being encountered or are foreseen.

CONCLUSIONS

The Wireless Institute believes that the present approach by the Department of Communication to Amateur Service repeaters and translators is generally satisfactory. This is shown by the ever increasing number of these devices that are being placed into service by the amateur fraternity.

However, there are a number of points arising out of the new regulations which require further discussion and consideration. Accordingly the Wireless Institute makes the following recommendations:

1 That the justification or need for a repeater is a matter for the Amateur Service to determine.

2 That the Wireless Institute develop and publish guidelines for the use of various modes of repeaters as required.

3 That the Federal Executive co-ordinate repeater license applications in accordance with a procedure to be determined.

4 That the Wireless Institute develop a set of maximum time-out periods for various modes and locations of repeaters and other technical standards as necessary.

5 That the Wireless Institute discuss further with the Department of Communications the effects of ensuring amateur repeaters meet specifications of constructional and operational standards with a view to minimising the effect on amateur repeaters when interference is being caused by other spectrum users.

6 That the guidelines proposed for the cross-linking of repeaters in the Amateur Service be approved.

If the above recommendations are accepted by the Department of Communications, then the enhancements they permit to the amateur service repeaters will allow amateurs to continue to experiment with new technology, and to provide valuable community service in times of need.

THE NEXT STEP

Complete copies of Issue 3 of this paper have been circulated to all Divisions of the Wireless Institute. It is currently undergoing its final refinement, pending its presentation to the 1986 Federal Convention in April 1986. Any comments or suggestions should be made as soon as possible, either to your Divisional Technical Advisory Committee or to FTAC. This will enable them to be considered prior to the printing of the convention papers. It is not until the convention has considered this paper and voted to accept it, either in part or in full, that it will become WIA policy.

AR

Dick Butler, Secretary General ITU, addresses the opening of the Conference.
Photograph courtesy BREAK IN

Ron Henderson VK1RH, Wally Watkins VK2DEW (partially hidden) and David Wardlaw VK3ADW.
Photograph courtesy BREAK IN

SIXTH IARU CONFERENCE OF REGION THREE

From the 13-17th November 1985, the sixth Conference of the Region 3 IARU Association was held in Auckland, New Zealand. Following is a brief report of the Conference and the speech delivered by Dick Butler, Secretary-General of ITU. A WIA delegation attended the Conference.

FROM IONOSPHERE TO DEEP SPACE

I am very honoured to participate in the General Assembly of the International Amateur Radio Union Region 3 and to bring you greetings of the 160 Member States of the International Telecommunication Union — the ITU. I am pleased to see radio enthusiasts from *so many* countries present here in this beautiful city of Auckland.

The choice of venue for this year's conference I believe is especially appropriate, being situated in a country which has a remarkable record of contributions to the development of international telecommunications and which is encouraging radio amateurs to enjoy their hobby and to render service to the community. Amateur radio is, in fact, the only hobby provided for by international treaty, ie the Radio Regulations annexed to the International Telecommunication Convention.

The Radio Regulations define amateur radio as "a service of self-training, intercommunication and technical investigations carried on by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest". Radio amateurs belong to a group of devoted enthusiasts scattered all over the world. They have organised a network of radio communication that extends over the globe, probably the only system which can be correctly described as global.

Amateur radio began back in the early days of the art, when radio was known as "wireless". At that time, there was not the present sharp line of distinction between professionals and non-professionals, experimenters, scientists, engineers, hobbyists — all were amateurs.

On 8th December 1864, six months before the creation of the International Telegraph Union (which in 1932 became the International Telecommunication Union), Professor James Clark Maxwell read a paper before the Royal Society of London on "A dynamical theory of the electromagnetic field". One section of this paper entitled "Electro-magnetic theory of light" set out the classical equations describing the relationship between light waves and the travel of electromagnetic disturbances.

About a *quarter* of a century later, Heinrich Hertz succeeded in generating radio waves a few metres in wavelength, and demonstrated their similarity to the shorter waves of light by their reflection and refraction properties. Within the next decade, Guglielmo Marconi in England, and Alexander S Popov in Russia, had started to use these waves for experiments in practical communication. When, in 1901, Marconi demonstrated the transmission of radio signals across the Atlantic Ocean, it became evident that there was a need for scientists to understand and explain the propagation phenomena associated with such transmission round the curved surface of the earth.

In 1907, voluntary investigators conducted circuit tests on short waves to demonstrate that stable communications were feasible on wavelengths below 200 metres. These pioneers soon had many disciples but the amateur field was quickly appropriated by people fond of tinkering with equipment and interested in picking up transmissions from large broadcasting stations. Investigation was not confined to the old world.

Innovators, driven by the isolation of distance in Australasia, were also very prominent. Indeed in the last few days, some of you participated in the commemorative function to recognise the 75th Anniversary of the Wireless Institute of Australia the oldest of its kind in the world. Respect was given to the large number of radio pioneers whose scientific curiosity did much to develop southern hemisphere radio research and information.

Once broadcasting was no longer esoteric, people seriously interested in research — those who claimed that they alone were entitled to call themselves "radio amateurs" — concentrated on the study of shortwave propagation.

In 1923, radio amateurs really came into their own. On 26th November 1923, the French station 8AB and the American station 1MO set up the first bilateral communication across the Atlantic. This was done on a wavelength of 100 metres, even though most ambitious amateurs did not believe transmission below 180 metres was possible. The shortwave radio cult began that day. Enthusiasts banded together in ever increasing numbers and with an ardour that frequently bordered on the fanatical.

In the early 1920s it was discovered that the long-distance radio transmission which had been observed ever since the start of radio were due to radio signals being reflected back to earth from the ionosphere. This reflection process was, unfortunately, not simple. It was not as if there were a mirror up in space. The reflective properties varied continuously rather like the weather with recurring patterns depending upon the time of the day, the season and the level of the sun's activity.

These variations affected different frequency bands in different ways and as a result of this it became necessary to share the high frequency bands in different categories of users such as the maritime services, broadcasting etc on a recurring basis throughout the spectrum so that each user category of service received a selection of frequency bands. This was necessary to provide a measure of continuous communications.

The point I want to make in bringing this early history to your attention is that the systematic division of the radio frequency spectrum, as we know it today, stems largely from the use of space — the ionosphere by radiocommunications.

In this regard, major contributions were made by radio amateurs in conducting research in radio technique, and in the properities of the ionosphere with comparatively simple apparatus. Radio amateurs were thus involved in the exploration of space long before the material used with the help of rockets and satellites, and well before the International Radio Conference, held in Washington DC in 1927 which drew up the first allocation table extending into the high frequency part of the spectrum. Subsequent ITU radio conferences evidently refined and amended the allocations made in 1927. The general World Administrative Radio Conference, WARC 79, took a large number of decisions for better sharing of the frequency spectrum. The conference also laid down long-term guidelines for the optimum use of the radio frequency spectrum. It drew up a program of future specialised conference to deal with specific services.

Only a few weeks ago the First Session of the World Administrative Radio Conference on the use of the geostationary — satellite orbit and the Planning of space services utilising it concluded its work in Geneva. I am glad to know that, as was the case on the occasion of previous World and Regional Administrative Radio Conferences, the IARU had again sent a delegation of radio amateurs to Geneva to follow the proceedings of this historical and extremely complex conference in its search for acceptable means of guaranteed access to the geostationary orbit. I am sure, too, that they made new friends for amateur radio among the representatives of ITU's Member countries.

Radio amateurs have built the series of OSCAR satellites and its successors and tried them out as soon as satellite communication was found feasible. Radio amateurs have served as a nucleus to bring about many advances in radio techniques and in the improvement of human relationships. This nucleus will grow in size and advance in level. Because they are amateurs, the only driving

force urging the world's more than 600 000 radio amateurs is their interest — interest in human contact and interest in improving their technique, which has as its ultimate objective the broadening of the sphere of this contact. It is a hobby which I should like to see introduced on a large level in as many ITU Member countries as possible. At the beginning of the electronic era many people are afraid of science and engineering, assuming they are difficult subjects beyond their grasp, but radio amateurs can show them otherwise by their own experience. Amateur radio clubs particularly in developing countries can interest laymen and young people in radio and, through radio, science in general.

I urge you to share your amateur radio know-how with your friends, with youngsters of your respective countries and to transfer it to the young generation of the many developing areas and countries of this vast Region 3.

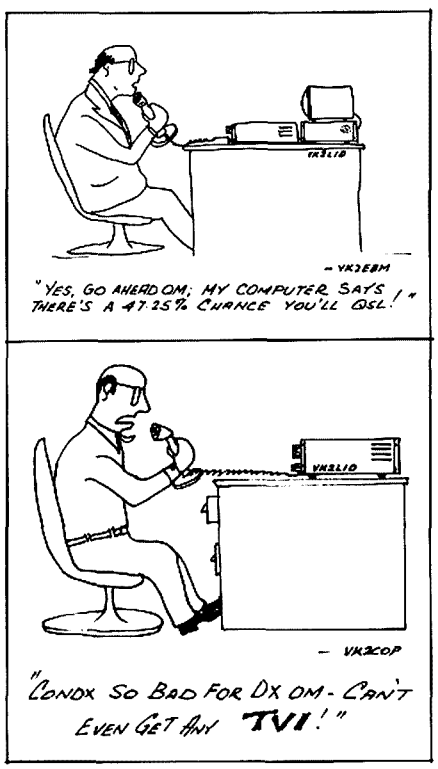
ITU seeks your co-operation. Indeed, with the IARU we are arranging in 1986 a training course in the administration of the amateur radio service in Nairobi, Kenya, during September 1986 and on the eve of AFRICA TELECOM 86. We are exploring similar possibilities in Region 3.

Thank you once again for having given me the opportunity to address this meeting and to assure you of my continuing support. I am privileged to be the patron of the International Amateur Radio Club. Most of you have certainly had the opportunity to contact its international amateur radio station 4U1ITU at ITU Headquarters. You are welcome to operate this station whenever you come to Geneva.

In October 1987 the ITU is organising TELECOM 87, the fifth quadrennial World Telecommunication Exhibition and FORUM in Geneva. It is the world's largest and most prestigious telecommunication event. Floorspace is available for an IARU pavilion. Why not make TELECOM 87 your rendez-vous for an eyeball QSO with your friends from other parts of the world. Operate 4U1ITU from Geneva. If you cannot be with us in Geneva meet us on the air. Plan special amateur radio events to highlight TELECOM 87 now.

May I offer you my best wishes for the success of your noble efforts. Thank you Mr Chairman.

R E Butler
Secretary General
13th November 1985 Auckland



SUMMARY REPORT

This report is a summary of the main business of the Conference giving information of a general nature.

The Conference was convened in collaboration with the New Zealand Association of Radio Transmitters (NZART), the host society which arranged for all secretarial facilities required for the Conference at the hotel including tape recording of the whole proceedings of the meeting.

The participants were delegates of 10 member Societies, viz ARRL, CRSA, JARL, KARL, MARTS, NZART, ORARI, PNGARS, RSGB, and WIA, the President, Vice-President and Secretary of IARU and four Directors, the Secretary and Assistant to the Secretary of the Region 3 Association.

Proxies were held for BARL by RSGB, HARTS by ORARI, PARS by JARL, SARTS by WIA, PARA by NZART, and BARTS by MARTS.

Both Region 1 and 2 were represented by their respective Presidents and Secretaries. The ITU was represented by R E Butler, Secretary General of the ITU.

Region 3 Directors' Meeting was held on the day prior to the Conference to deal with a number of administrative matters.

OPENING CEREMONY

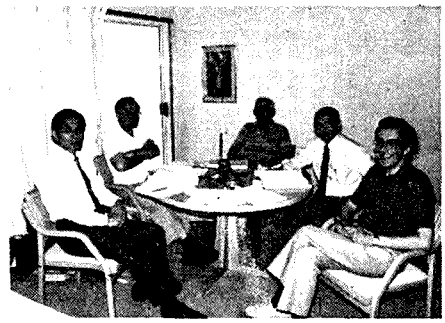
Terry Carrell ZL3QL, President of NZART, said that it was a great honour for New Zealand and NZART to host this Sixth Triennial Conference of the Region 3 Association.

Terry offered a special welcome to Chinese Radio Sports Association (CRSA) and Organisation Amateur Radio Indonesia (ORARI) as well as the other delegates. He noted with sadness the loss of W4KFC, HS1WR AND JA1NAT and asked those present to remember their efforts on behalf of amateur radio.

Jock White ZL2GX, NZART Contest Manager (right), talks with David Sumner K1ZZ, Executive Vice-President ARRL.
Photograph courtesy BREAK IN

Dame Cath Tizard, Mayor of Auckland, addressed the assembly and welcomed all Delegates, Observers, and guests to Auckland and wished the Conference well.

The Conference was formally opened by the Hon Jonathan Hunt, Post Master General/Minister of Broadcasting for New Zealand. Mr Hunt noted that this was the first International Radio Union Conference to be held in New Zealand and it was the first Region 3 Conference attended by the Secretary General of the ITU.



The Directors of Region 3 meet (from left) Keigo Komura JA1KAB, David Rankin 9V1RH/VK3QV (Chairman), Jumbo Godfrey ZL1HV, Masayoshi Fujioka JM1UXU, and Michael Owen VK3KI.
Photograph courtesy BREAK IN

Mr Hunt welcomed all the overseas delegates to the Conference and noted that this was the first occasion that representatives from the People's Republic of China had attended an International Amateur Radio Conference. He said that amateur radio has a proud and honourable tradition of service to the community and of keeping itself in the forefront of technology.

Mr Hunt noted that without goodwill the amateur service would have difficulty in retaining its allocations. In his view it was a measure of the success of the amateur service in New Zealand that it continue to grow; that it catered for the wide range of people from all walks of life and age groups.

Mr Richard Butler, Secretary-General of the ITU, said that he was very honoured to participate in the General Assembly of the IARU Region 3 and brought to the Conference the greetings of the 160 Member States of the ITU.

Richard Baldwin W1RU, President of IARU, thanked the Mayor and the Minister for his support of amateur radio. He said that such support was important because New Zealand had been a staunch supporter of IARU since the very beginning and that this would continue for a long time. He also thanked the Secretary-General of the ITU saying that such support was critically important to radio amateurs. He said that it is from ITU Conferences that all of our privileges flow. The most necessary ingredient for radio amateurs was frequency allocations — to achieve these allocations amateur radio needed to be adequately represented and to participate in IARU Conferences.

Mr Baldwin noted the vast improvements in the relationship between amateur radio and the ITU in the last decade.

Mr D Rose, Assistant Director General of the New Zealand Post Office, addressed the meeting. He noted the special licences which had been issued to delegates from countries, many of which do not normally have reciprocal agreements with New Zealand. He said that New Zealand was proud to have helped to achieve a high status for radio amateurs around the world by its support of amateur radio at International Conferences. He wished the delegates a successful Conference.

The Minutes of the Fifth Regional Conference, held in Manila in 1982, were received and adopted. The formal reports submitted by the Secretary, individual Directors and member Societies were noted. In addition, the reports of the Region 1 and Region 3 Secretaries were noted, as was that of the President of IARU.

RECOMMENDATIONS AND ACTION

Working Group No 1 was set up "to review band plans previously adopted by the Association having particular regard to the 28MHz band and the position of Packet Radio, and other special modes, in any band plan and to recommend band plans as considered appropriate for the HF, VHF, and UHF bands".

Band plans were prepared and approved for 7MHz through to 1296MHz.

Concerning the 10MHz band, it was agreed that IARU Societies be encouraged to negotiate with their administrations for the use on a local non-interference basis of the 10.150-10.200MHz band, in order to indicate the need to administrations for an expansion of this band on a more permanent basis to meet the needs of the amateur service.

All Societies were encouraged to take appropriate action to ensure that the transfer procedures for the WARC 79 bands were completed by 1st July 1989. In addition, where the WARC 79 bands were not yet allocated, to continue the work necessary to gain access to these bands.

Working Group No 2 was set up "to draft one or more resolutions as are considered appropriate to express policy in respect of the following general areas:

1 participation of the amateur service and the amateur satellite service in currently scheduled ITU Conferences and appropriate funding required

2 the position or preparation of a position for the amateur service and amateur satellite service in respect of frequency and regulatory matters for administrative radio conferences, that could affect the services, and the advancement of the position of the services to include representation, and materials for such purposes, and participation in the activities of appropriate organisations.

VK3ADW (WIA) was appointed Convenor, with ZL2AZ (NZART), W1RU (IARU President), 9V1RH (Region 3 Chairman of Directors), and 9M2SS (MARTS) active as members.

Ideas brought up during the Working Group discussions included the following:

AMATEURS ON ITU DELEGATIONS — There are two possibilities,

i An amateur who is part of a Delegation in his profession or job capacity, NOTE: such a person may be somewhat limited by the "modus operandi" of his leader and/or delegation.

ii An amateur financed by his IARU Society and who is officially included in the Delegation for the purpose of representing the amateur service. NOTE: may be limited as in i above, but usually not to the same degree. Possibility ii is the preferred situation to work for and we recommend that Member Societies be encouraged to achieve this end.

PARTICIPATION —

i In Preparatory Conferences — SPM etc

ii In the work of the CCIR.

iii At IFRB Forums that are open to the IARU.

PRESENT APPROPRIATE PAPERS IN THE ITU JOURNAL.

IDENTIFY POTENTIAL CHAIRMEN OF ITU WORKING GROUPS AT WARC/RARCs and ensure that these people are fully briefed in matters concerning amateur radio. Also similarly identify and brief other influential ITU and National Administration officers.

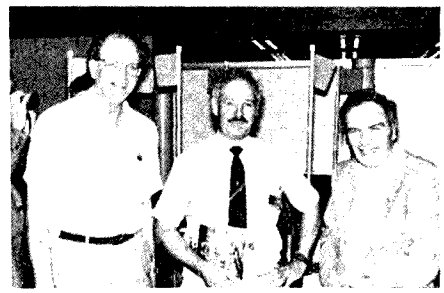
Five resolutions concerning these matters were passed. The first concerned the importance of Region 3 Association observers at ITU Conferences. The second concerned a future possible General WARC and the development of goals and objectives. The third concerned the initiation of a continuing program to ensure world-wide support for the interests of amateur radio before and at future ITU Conferences.

The fourth encourages the continuing participation of the IARU in the work of the CCIR.

The fifth concerned the Regional Administrative Radio Conference to "establish criteria for the shared use of the VHF and UHF bands allocated to the FIXED, BROADCASTING and MOBILE SERVICES in Region 3" sometime in 1987/88. And indicated that this conference maybe of such importance that the highest level of participation will be required, including amateurs on national delegations.

Suggestions as to the funding required were also put forward.

Working Group No 3 was set up to "review the Constitution and Bylaws of the IARU and to recommend to the conference a policy in respect of the Constitution and Bylaws of the IARU, including the amendments, if any, considered desirable".



FROM LEFT: Fred Johnson ZL2AMJ, new Director IARU Region 3, Terry Carrell ZL3QL, Chairman of Conference and President NZART, and Pedro Siedeman YV5BPG, President IARU Region 2.
Photograph courtesy BREAK IN

G3GVV (RSGB), was appointed Convenor with ZL1HV (NZART), VK3KI (Region 3 Director), VK4ZXZ (WIA), and JA1AN (JARL), acting as members.

This working group reported that having considered the papers submitted to this Conference, and Resolution 84-3 of the Administrative Council, it is considered that amendments to the Constitution and Bylaws of the IARU are desirable.

In proposing amendments and matters for further consideration, certain Principles have been adopted —

Changes should be made to the Constitution and Bylaws of the IARU bearing in mind the following Principles —

a The language used should be clear, unambiguous and consistent and used bearing in mind that English is not the first language of many that will use the documents;

b Whilst it is highly desirable for Member Societies to be members of the appropriate regional organisation, this should not be mandatory;

c Member Societies should have the right to make proposals to, and otherwise deal with the IARU and not necessarily exclusively through a regional organisation;

d The Constitution should put beyond any doubt that the supreme authority of the IARU lies with its Member Societies acting collectively, and appropriate means should be provided in the Constitution for that authority to be exercised effectively, particularly to meet an urgent need;

e To meet the need referred to in (d), provision should be made to permit a plenary meeting (whatever called) to be convened, but only if required by sufficient Member Societies, representing sufficient radio amateurs;

f The provisions relating to the appointment of the President and Vice-President of the IARU should be amended to put the procedures necessary for such an appointment beyond doubt.

The following resolution was passed. NOTING Resolution 84-3 of the Administrative Council inviting suggestions for improvement to the Constitution and Bylaws of the IARU. RECOGNISING that there is a real need for the improvement of the Constitution and Bylaws. RESOLVES to recommend the adoption of the amendments, set out in the copy of the Constitution and Bylaws annexed to this Resolution. RESOLVES to adopt the Principles set out in the Report of the Conference Working Group annexed to this Resolution. RESOLVES to request the Administrative Council to circulate this Resolution and the documents annexed to this Resolution.

The amendments proposed were entirely in line with those contained in the joint WIA/NZART position paper presented at the Conference.

The Conference agreed that Societies would publish appropriate guidance to their members to engender a wider understanding of the appropriate practices concerning the exchange of QSL cards.

It was agreed that the Directors of Region 3 appoint two representatives to the Administrative Council, before each meeting of the Administrative Council, having regard to — *the desirability of selecting representatives with the appropriate skills, the availability of the proposed representatives to attend the Meeting, the need for continuity of representation and the desirability of giving broad IARU experience to those actively involved in the affairs of the Association.*

It was agreed that amateur radio entry standards continue to be studied with a view to producing an IARU guideline.

A Study Group, initially consisting of six persons was set up to consider legislation for the amateur licence and amateur operation.

The Association formally thanked JARL for the publication of REGION 3 NEWS over the past three years.

Working Group No 4 was set up "to report to the COnference on action, if any, that could be desirable for the Conference to take in relation to amateur satellites, having regard to papers submitted to the Conference".

Resolutions involving amateur satellite co-ordination and financing were adopted by the Conference.

Working Group No 5 was set up "to provide a report to the Conference identifying the most appropriate means by which amateur radio can be encouraged and promoted by the Association and its member Societies", to provide assistance to developing countries.

It was agreed that a needs and resources available questionnaire be completed by Member Societies.

Member Societies will endeavour to limit the use of special call sign prefixes to national or international events or amateur radio events of an outstanding nature.

It was agreed that in addition to the "Human Language System" developed by JARL, the IARU (Region 1) International Locator System, often referred to as the Maidenhead Locator System, be adopted by Region 3 Societies.

Region 3 adopted ARDF rules based on the Region 1 rules. This matter will be reviewed at the next Region 3 Conference.

It was further agreed that Region 3 Member Societies encourage the promotion of ARDF activity in the Region, noting that it is an activity which should appeal to young people.

The rules of the Region 3 Award have been updated to take account of the new Societies which have recently joined the Union, and the USA and UK possessions in Region 3.

It was also agreed that the number of countries for the Gold and Silver endorsements be increased but the basic certificate qualification remain unchanged.

The IARU Region 3 Association adopted, in principle, the Region 1 HF emergency procedure.

It was agreed that Region 3 adopts the recommendations of the Monitoring System Study Group and it was also agreed that NZART, WIA and JARL collectively nominate to the Directors of

Guy Minter VK4ZXZ becomes a magicians assistant for magician Yutaka Kasahara JA1CLN at the JARL Reception.
Photograph courtesy BREAK IN

Region 3 a new co-ordinator for the Monitoring System in Region 3.

Concerning the International Beacon Project, it was agreed that the Administrative Council be asked to encourage, co-ordinate, and arrange — advice to member Societies on the procedures for reporting the reception of beacons on a regular basis; the dissemination of changes in beacon status. Suggestions are by courtesy of ARRL through W1AW Bulletins and by regional journals; a world-wide beacon system on additional HF bands; a review of the present international beacon project in the 28MHz band with the view to converting it to single frequency beacons of the type used at 14.100MHz; in conjunction with NCDXF, produce beacon control unit kits for sale to those Societies able to pay tor them, and as gifts to those which cannot; greater publicity for the beacon system, and ask all amateurs (via National Societies) not to transmit on beacon frequencies; urgent consideration to these matters in view of the present condition of the sunspot cycle.

It was agreed that the Region 3 Secretary prepare, for the next Conference, a new contest schedule document in order to establish a contest calendar.

A Working Group was formed to advise upon contest segments for each amateur band. The Working Group would carry out its business by correspondence and report to the next Conference.

The Conference proclaimed 17th June as QRP Activity Day in Region 3.

It was agreed to note the recommendation that Region 1 has recommended right-hand polarisation for 2.3GHz EME working.

The AX25 protocol was adopted as an interim preferred standard for Packet Radio and ARRL was asked, through their Ad Hoc Committee on Amateur Radio Digital Communication to act as the co-ordinating body subject to the requirements of radio amateurs as expressed through IARU.

Concerning RTTY Technical Standards it was agreed that — all IARU Member Societies adopt CCIR 476 in both modes 'A' and 'B' so that AMTOR may be a truly International Standard; a speed of 45.45 is retained, but speeds of 50, 75, and 100 Bauds should be encouraged; each Society however, only where such requirements still exist, should press their respective licensing authorities to remove the requirement for "dual identification" when using the International Standard CCIT/Number 2 Code; the minimum specification for the signalling format should be one start bit, seven data bits, one parity bit, one stop bit. The parity should be as follows: *if generated — even parity . . . if not generated — parity bit set to space.*

The Administrative Council Resolution 84.5 on World Radio Amateur Day was endorsed.

The Conference recognised the problems caused by DX-peditions.

It was agreed that the Administrative Council emphasise to IARU Member Societies the importance of their members adhering to the spirit and intentions of the ITU Radio Regulations, and only to handle traffic which does conform. Member Societies should be encouraged to progress violations as appropriate.

The Conference deplored the use of radio frequency bands allocated to the Amateur Service by unqualified operators and unlicensed stations.

The IARU Administrative Council will be asked to develop a policy statement to draw the attention of all Member Societies and radio amateurs to the need to preserve standards for operator qualification and correct station licensing, and for them to make their concern known to their licensing authority.

FROM LEFT: David Wardlaw VK3ADW, Judy Wardlaw, Shozo Hara JA1AN and Junko Tanaka JR1ANP.

Several procedural matters relating to the Region 3 constitution and regulations were amended to reflect present needs. The finance sub-committee produced three budgets, one based upon existing subscription rates, another which accommodated representation at all desirable ITU Conferences, and a third which was a compromise mid-way course.

This mid-course option was adopted leading to an increase in subscriptions of about 20 percent.

The location for the Seventh Conference was chosen by secret ballot as Seoul, hosted by KARL, following the Olympic Games in 1988.

The WIA delegation, David Wardlaw VK3ADW, Delegate, and Ron Henderson VK1RH, Wally Watkins VK2DEW, and Guy Minter VK4ZXZ, acting as Observers, hold copies of the Conference papers and are available for further consultation by members.

AR

BEAM HEADINGS AND GREAT CIRCLE DISTANCES

Tony Belts VK6ZBU
PO Box 120, Carnarvon, WA. 6701

The writer was inspired by VK1MM's article in September's Amateur Radio, page 21 and was prompted to re- write the listing for use on a Microbee computer.

```
00100 REM GREAT CIRCLE DISTANCE AND BEARINGS
00110 REM ADAPTED FOR MICROBEE BY T. BELTS  10/10/85
00120 REM FROM AN IDEA FROM AMATEUR RADIO 9/85 P21
00130 CLS:POKE 140,1:REM  BREAK KEY DISABLE
00140 K0=111.12:M0=57.295779:N0=60:S0=69.06
00150 PRINT"GREAT CIRCLE DISTANCE AND BEARING
00160 PRINT"Enter values in whole degrees and decimals.  Use -VE prefix for
00170 PRINT"South Latitudes and East Longitudes."
00180 PRINT:PRINT"At present Carnarvon ( 24.88 S  113.67 E ) is the source"
00190 PRINT"location.  Do you wish to input a different location? (Y/N)  :
00200 G0$=KEY$:IF G0$="" THEN 200
00210 IF G0$="N" OR G0$="n" THEN 280
00220 IF G0$="Y"OR G0$="y" THEN 240
00230 GOTO 200
00240 PRINT:PRINT"INPUT SOURCE LOCATION NAME    .H0$
00250 INPUT"LATITUDE                .A2
00260 INPUT"LONGITUDE               .L1
00270 GOTO 310
00280 H0$="CARNARVON":REM H0$ = FIXED SOURCE LOCATION NAME
00290 A0= 24.88:REM A2 = FIXED SOURCE LOCATION LATITUDE
00300 L1= 113.67:REM L1 = FIXED SOURCE LOCATION LONGITUDE
00310 A0=A0/M0
00320 PRINT:PRINT"INPUT REMOTE LOCATION NAME    .F0$
00330 INPUT"LATITUDE                .B0 B0=B0/M0
00340 INPUT"LONGITUDE               .L2
00350 L0=(L1-L2)/M0
00360 E0=SIN(A0)*SIN(B0)+COS(A0)*COS(B0)*COS(L0)
00370 D0=-ATAN(E0/SQR(ABS(1-E0*E0)))+1.570796
00380 C0=(SIN(B0)-SIN(A0)*E0)/(COS(A0)*SIN(D0))
00390 IF C0>=1 THEN LET C0=0 GOTO 410 ELSE IF C0<=-1 THEN LET C0=180/M0:GOTO 410
00400 C0=-ATAN(C0/SQR(ABS(1-C0*C0)))+1.570796
00410 C=INT(C0*M0)
00420 IF SIN(L0)<0 THEN LET C=360-C
00430 R=INT(D0*N0)
00440 IF R>360 THEN LET R=R-360
00450 CLS
00460 OUT#1,0:REM FOR // PRINTER, OR OUT#5,0 FOR SERIAL PRINTER
00470 REM DELETE LINES 460 AND 550 IF NO PRINTER USED
00480 PRINT"GREAT CIRCLE BEARING AND DISTANCE TO    .F0$
00490 PRINT FROM    .H0$
00500 PRINT:PRINT BEARING    .C;  DEGREES (SHORT PATH)
00510 PRINT                  .R;  DEGREES (LONG PATH)
00520 PRINT:PRINT DISTANCE    INT(D0*M0*M1);  Nm
00530 PRINT                   .INT(D0*M0*M1*1.15);  Miles
00540 PRINT                   .INT(D0*M0*M1*1.852);  Km
00550 PRINT:PRINT OUT#0:REM PRINTER OFF, VDU ONLY
00560 PRINT:PRINT"DO WISH TO CONTINUE? (Y/N)"
00570 G0$=KEY$:IF G0$="" THEN 570
00580 IF G0$="Y" OR G0$="y" THEN 130
00590 IF G0$="N" OR G0$="n" THEN 610
00600 GOTO 570
00610 CLS:POKE 140,0:END:REM BREAK KEY ENABLE
```

The listing in September will not work in a Microbee because of a missing ABS command in lines 170 and 200. In the re-written version, the correct syntax is shown in lines 370 and 400.

There are a few enhancements, such as allowing the option to have a fixed, or user input source QTH, without having to modify the program before execution. Thus distances and bearings from anywhere to anywhere can be computed quickly and painlessly. Included also is the option of a hard copy with either parallel or serial printer output.

Fixed source QTH details must be entered on lines 280, 290, and 300 before operation. Default details for Carnarvon are given as an example.

As in the previous program, this one should be easily converted for any other machine.

AR

QSP

PLAN FOR UHF TELEVISION

The Federal Government has decided that the ultra high frequency band (UHF) will be used by all new commercial television services in regional areas. And the Wollongong station WIN4 will move to UHF in 1989, to make way for the development of FM radio services.

The use of UHF, rather the VHF is part of the Government's plan to bring more commercial television services to regional areas. Congestion of the VHF band has meant that extension of television is only possible through UHF.

In most cases, existing commercial services and the ABC will continue on VHF which gives a mixture of both VHF and UHF. UHF is used in the UK, Europe and the USA.

AMATEUR RADIO — FUTURE DIRECTION

A discussion Paper

A Discussion Paper Compiled by
Jim Linton VK3PC
Roger Harrison VK2ZTB

This paper is intended as a starting point for dialogue and discussion for overcoming the downturn in amateur radio and to ensure its long-term survival.

The current level of youth involvement is extremely low. In the 21-35 age group it is lean and insufficient people age 50-plus years are entering the hobby.

There has never been a serious exploration of all possible ways to increase amateur radio's attractiveness and relevance in an increasingly technological society.

Questions addressed in this paper include making amateur radio more dynamic and relevant to expanding technology, increasing the number of entry points, and lifting the level of youth involvement in the hobby.

It puts a reasoned argument for giving Novices data communication privileges — a need already recognised and supported by the American Radio Relay League (ARRL) for the US situation.

In addition to enhancing or upgrading the existing Full, Limited, and Novice licences, this paper argues for the introduction of a new licence giving VHF/UHF/Multi-modes.

A telephony licence for beginners on VHF/UHF is also advocated as an additional entry point into the hobby, similar to the successful Japanese telephony licence.

The sooner these changes are made — the sooner Australian amateur radio can get out of its current stagnation, and increase youth, adult, and retired person's participation in the hobby.

INCREASING THE HOBBY'S ATTRACTIVENESS

All possible avenues of greater participation in our hobby and ways to make it more relevant to a wider range of people should be explored to ensure its long-term well-being. The hobby needs to be made meaningful for a whole new untapped generation of computer hobbyists, which includes large numbers of teenagers and primary school children. At the same time it should have increased attractiveness to the growing number of technically educated and stimulated people in our community.

Amateur radio needs to be both more dynamic and relevant to the computer, information technology, and satellite communication age for it to be a desirable progression for computer hobbyists, technicians, and engineers. Among these people are innovators and experimenters who would be an asset to amateur radio.

The emerging computer technology should be married to amateur radio for the fullest possible benefit of the hobby. However, the current novice licence, with its operating privileges, is neither attractive to the large and growing pool of computer hobbyists, nor very attractive to the technicians and trainees in various electronics related fields.

Computer hobbyists cannot use their computers on the novice amateur bands — and technician-types see the Novice (in fact, some wrongly perceive amateur radio generally) as only a voice hobby communicator medium, similar to CB radio. The present licensing system does not give them suitable entry points.

COMPUTER HOBBYISTS AND COMMUNICATIONS

Computer hobbyists are showing an increasing interest in 'digital' communications via radio. During my term as Editor of ETI, I saw convincing evidence of this. In the April 1983 issue of ETI, I published a project contributed by Tom Moffat VK7TM — the ETI-733 Radio Teletype-to-Computer Converter. This is a simple to build, receive-only project designed to attach to the parallel I/O port of the Microbee. Frankly, at the time, I regarded it as a special interest project only. How wrong I was! It was an instant success and to late 1984, something in excess of 3000 were sold! (Judging from actual sales figures of the PC boards). Such sales put the project in the 'good seller' category. Of the feedback received on this project, a high percentage was from non-amateurs.

In the September 1983 issue of ETI, I published another project of Tom Moffat's, the ETI-736 FAX decoder. Having learned from the early success of the ETI-733 RTTY decoder, this time I made it the feature project. The result was similar. Again, a significant proportion of reader feedback came from non-amateurs.

The feature project of the first issue of AUSTRALIAN ELECTRONICS MONTHLY was the 'Listening Post' (AEM3500), once again by Tom Moffat, and with software to suit the Microbee to decode Morse/RTTY and FAX. Kit retailers report this is the most popular of the AEM projects to date, bar none, even exceeding the success of the earlier ETI projects.

Whilst I haven't attempted to collect comprehensive reader feedback statistics I would say the non-amateur feedback exceeds the amateur or communications enthusiast feedback. With this project, the demands for us to publish software for computers other than the Microbee has been staggering.

While at a school function in mid-1984, my wife and I got talking to another parent and we discovered his boy and our two boys had an interest in common — computers! (No surprise there). This lad boasted he had completed 50 telephone 'contacts' via modem just that week and (having only recently obtained a modem) suggested our boys arrange contact. Telephone numbers were exchanged.

Now doesn't this have a familiar ring to it? (Pardon the pun).

My eldest son and I have rung up a variety of bulletin boards around the country on occasion, and we are Viatel subscribers.

One thing we have noticed — it can be murder trying to get onto popular bulletin boards and Viatel some days in the afternoon after schools out (ie between 4-6pm). I don't know how frequently the bulletin board 'mailbox' facilities are used, but from asking around they are popular and it appears telephone 'contacts' between computer hobbyists are seemingly an everyday event.

The inevitable course of technological hobbies is for the hobbyists involved to gradually advance their knowledge and techniques and the expand their fields of endeavour. That is, unless either a social, governmental or technological barrier prevents further growth.

On that basis, it seems to me that computer hobbyists, taken as a group, will find packet radio, RTTY, AMTOR, FAX, ATV and digital satellite communications of interest at some stage. Certainly, the evidence is there that some at least have already evinced an interest in a few of these areas.

HAS AMATEUR RADIO A FUTURE WITHOUT EMBRACING COMPUTER TECHNOLOGY?

Put yourself back to the immediate post-WWI era (hindsight has 20-20 vision, remember), when spark transmitters and coherers reached their zenith. Re-couch that question to: *"Is there a future for amateur wireless if it fails to embrace vacuum-tube technology?"*

Technologies appropriate to solving technical or technological imperatives have always been adopted in groups of technical people where freedom to choose the appropriate course have been the order. Witness the adoption of SSB by the amateur fraternity. It was adopted owing to pressures of a technical imperative - overcrowding on the HF amateur bands. Indeed, the amateur service was the first communications service in the world to wholly adopt SSB as a communications mode where it was most necessary.

Take a case closer to home: the Australian VHF/UHF repeater system. Repeaters sprang up among a special interest group within the amateur fraternity. They were already a necessity for commercial mobile operation at the time (late 60s), and their technical advantages for mobile operation are well-known. However, because the early amateur repeaters on-air were initiated by disparate groups in widely separated areas, no common technical standards regarding actual frequencies, channel spacings and input-output frequency spacings were set down prior to their establishment.

That was the 'experimental' phase. When they began to proliferate and demand for more repeaters arose, a technological imperative forced a change on the status-quo and nation-wide standard channels and input/output spacings were subsequently introduced.

It is our contention that amateurs will face a number of imperatives, both technological and social, in the not too-distant future and computer technology is something that will impose imperatives which we must face. This is part and parcel of a larger subject on what the future holds for amateur radio, a subject on which VK2ZTB has written about and been lecturing on, to clubs and other amateur groups, for some three years now. (See "Amateur Radio and the Face of Change", ETI, May 1984).

We think that the integration of the microcomputer into the amateur station will probably prove the catalyst that sparks off a new round of technological advancement within amateur radio. It will happen (has been happening) in simple ways at first. The adaptation of the new to the old-Morse and RTTY operation being prime examples here. Packet radio is seen as the next step, but is currently still in its infancy. And the computer (or microprocessor system) is becoming part of the station 'system tools', aside from part of the communications process. Log-keeping and antenna control are but two simple examples.

BRIDGING THE GAP BETWEEN COMPUTER HOBBYISTS AND AMATEUR RADIO

The tentative framework for such a bridge already exists. An interest in computer communications is quite strongly evident among computer hobbyists as they are the major purchasers of low-cost modems and the major customers of "freelance' bulletin boards and non-business, free access data-bases. As evidenced earlier, magazine projects which marry radio communications and home computers are among the most popular items sold by electronics kit and component retailers and a significant proportion of the purchasers of such projects are non-amateurs.

We believe that bridge should be 'built' from both sides. That is, on one side amateurs should be encouraged more to embrace computers and computer technology and to integrate such with their communications activities. The growth of packet radio and computer-RTTY/CW will aid this, but there other avenues as has been shown.

There is already considerable adaptation of computer technology among amateurs and suitable promotion (not just 'salesmanship') could accelerate this by bringing more attention to the what, the where, and the how.

On the other side, the amateur radio fraternity could promote itself among computer hobbyists. A small number of radio amateurs run bulletin boards and that seems like an excellent avenue. Articles in computer hobbyists publications on computers- in-communications from a radio amateur stand-point provide another (ideal) avenue and good examples already exist.

HOW BIG IS THE TARGET?

We can get an idea of the size of the target audience — computer hobbyists — by, firstly,

looking at sales of 'home' computer (ie non-business) systems in Australia over the past, say, five years.

In 1984, Commodore reported that their sales figures, after about three years in Australia, exceeded 250 000 units, the lion's share being VIC-20s and C-64s. Applied Technology (now Microbee Systems) launched the Microbee in March 1982 and by June 1985 reported sales of some 50 000 units here. A proportion of these went to education establishments and estimates put sales to hobbyist purchasers are around 20 000. In mid-1983, Dick Smith Electronics Introduced the VZ-200 home computer. By the end of 1984, I understand in excess of 30 000 had been sold. The Sinclair ZX80 and ZX81 computers were marketed here from 1980 through 1983, some 100 000 plus units being sold, I understand. The Dick Smith 'Super-80' kit computer, introduced in 1981, sold some 4 000 to 5 000 units over a period of about 18 months, I believe. The ETI-660 project computer, described in 1981, sold a total of around 3 000 units over the following two years.

I can't recall, or find, sales figures for computers like Dick Smith's Wizzard, the various Atari models, the Intellivision, the Sega, the various Tandy TRS-80 home computers, Amstrads, Apples, etc.

However, add it up and you are looking at a figure close to half a million units. Even that is probably conservative. It is not to say that that means half a million people own home computers. There are families with multiple computer systems.

*Computer sales comment by Roger Harrison

BENEFIT OF MORE ENTRY POINTS ALREADY SHOWN

The Novice licence introduced a decade ago provided an entry into the hobby for many of today's active radio amateurs. It was attractive to many of those initially attracted to CB radio who would not otherwise have taken the step towards amateur radio if the starting level had been the AOCP.

The Novice licence gives a direct stepping-stone to the AOCP — as shown by the estimated 70 percent who have upgraded. This grade of licence has given, for the first time in Australia, a 'Beginners' level access to the hobby. It provides an entry into amateur radio to those who otherwise, due to various reasons, could not achieve the AOCP — while also attracting many others with AOCP potential to take the first step.

The limited licence did a similar thing when introduced in 1952, but it also lured those purely interested (satisfied) with the scope available with a VHF/UHF licence.

THE FUTURE IS DIGITAL

Digital techniques are more than just character communication, a progression from Morse code and teleprinter.

It goes deeper than being able to store and retrieve messages, such as with bulletin boards.

Probably the most commonly known of emerging computer technology is packet radio — faster than RTTY and provides error-free transmission.

It is also character communications, and information transfer, and has demonstrated how experimenters can advance the radio art.

Packet communications did not originate in the amateur radio service, but we have taken the basic idea and shaped it into things that didn't exist before, or which have a slant different from what has been previously tried.

The traditional amateur radio touch had been added — extremely low cost.

in fact, amateur designed and built packet radio controllers have been adopted by the US Army and Navy, and are now finding their way into commercial applications.

Information transfer via packet and amateur satellites is another development.

Experimentation with non-character communication has just started — it is an area of experimentation ideally suited to amateur radio.

For example, take two Slow Scan TV units with digital outputs, plug them into packet controllers, and send absolutely error- free pictures.

Digitally techniques used for SSTV also enables pictures to be stored digitally and retrieved at any time.

Digitised voice can be sent over packet radio. Several voice repeaters could share the same high-speed digital network for repeater linking.

Using packet techniques and digital compression technology, medium-scan television that approaches fast-scan quality can be sent over high-speed packet nets with other traffic.

INTRODUCE A NEW LICENCE GRADE AND UPDATE THE NOVICE

A new licence grade, below the Limited licence level, could have a theory syllabus at the current Novice level, plus elementary theory areas of FM and Advanced Modes. This Intermediate (Digital) licence should give access to VHF and UHF, with appropriate bands and power limits. Telephony, repeaters, and specialised techniques including RTTY, ASCII, Packet, and Satellite operation could be permitted.

Using the Novice trend as a guide, a significant percentage of those entering the hobby via this new licence would upgrade. They would have a stepping-stone to the Limited Licence. It should capture the imagination of not only computer hobbyists but those training or employed in computer and communications-related fields.

The Novice licence should also be enhanced with the same VHF/UHF operating privileges, with the addition of data communication privileges on 10 metres.

An enhanced Novice licence could have the same theory syllabus as the new Intermediate licence proposed above.

SUMMARY SO FAR

1 The Current Novice-to-AOCP progression is not suited to the potential target group.

2 Amateur radio has much to offer computer technology hobbyists and other technically involved people but the current entrance step, the Limited licence, is a disincentive because of the quantum jump in technical radio knowledge needed.

SOME QUESTIONS AND ANSWERS

Q: How does the proposed new Intermediate licence theory paper align with the current Novice exam?

A: Retain the current Novice syllabus plus additional VHF/UHF/Advanced Modes Unit. With the enhanced Novice concept the same theory exam paper could be used for both the Intermediate licence grade and the Novice.

Q: What frequencies, power levels, and modes for the new licence?

A: Segments, or all of the 144 and 432MHz bands, with power levels similar to the current Novice limits, and all modes. An adequate delineation must be made to encourage upgrading to the Limited licence.

Q: What are the progressions from the Intermediate licence grade?

A: Up through the theory exam to the Limited, or sideways through the CW exam to the Novice.

Q: Why also add data privileges to Novices?

A: Additions to the syllabus would not destroy its purpose of being a beginners licence. The AOCP theory exam usually has only one question on advanced modes, covering such things as ATV and SSTV bandwidths, RTTY duty cycle, how repeaters repeat and transponders transpond, and what Is ASCII. Elementary theory of advanced modes and frequency modulation would not have a significant or detrimental impact on the Novice syllabus if the knowledge standard was set at the existing level.

Q: With Novice enhancement would existing Novices have to be re-examined:

A: This would not be necessary — the ARRL with its proposed Novice enhancement would automatically give existing licensees the new privileges.

Q: Would DOC consider another grade of licence?

A: Why not? All it needs is a further theory question bank on VHF/UHF/Advanced Modes at the elementary level.

Q: Would DOC enhance the Novice licence?

A: The 'Department would respond to enhancement proposals that had support.

RECREATIONAL AND EDUCATIONAL ROLES OF AMATEUR RADIO

The hobby can play an important part in our present-day society. With increasing leisure time it is an ideal pursuit for all age groups.

Instead of engaging in potential loose-end activities and associated trouble, youth development can result from involvement in amateur radio.

Teenagers, adults, families and the retired find amateur radio opens up a whole new world to them.

Their horizons are widened, and they make new friendships.

Many things have been said about the need for Australia to embrace rapidly expanding technology.

Industries are aware that without increased use of technology they will fail to reach world markets due to their uncompetitiveness.

A community grass-roots awareness of technology is one benefit from amateur radio.

This can help individuals to make a contribution in their work-place by more easily adapting to new technology, or by suggesting ways it could be better used.

As part of the education system amateur radio can be used to teach in a practical sense a number of subjects. These include mathematics, science, social studies, geography, and other studies.

Students at schools with an amateur radio station, by talking over the air-waves, develop their speaking, communicative and other life skills.

A TELEPHONY BEGINNERS LICENCE

This licence has been deliberately separated from the foregoing arguments in support of Novice enhancement and a new multi-mode Intermediate VHF/UHF licence to avoid confusion between the different concepts, but it fits in with the theme of this paper for more entry points into the hobby.

A Telephony Beginners licence should be introduced to give access to the hobby using segments of the 144MHz and 432MHz bands. The theory syllabus could include elementary subjects at a Novice level, without HF and telegraphy specifics, but VHF/UHF specifics. Candidates would be examined on the necessary elements of basic electricity, magnetism, RF generation, modulation, propagation and interference.

Progression from a Telephony Beginners licence would be up to the Intermediate licence grade, or with also CW to the enhanced Novice. This licence grade would be attractive to raw beginners who could truly be a part of amateur radio starting with a foot on the bottom step of a stair case with the top being the AOCR

In Japan, a telephony licence has been responsible for introducing thousands of newcomers to the hobby. These are the same radio amateurs most of us speak with on 21MHz daily — showing this class of licence has attracted beginners who are true amateur radio enthusiasts.

With such a licence in Australia we would be looking at similarly-attracted large numbers of newcomers of the same calibre.

A Telephony Beginners licence would easily fit into school curriculum as an elective subject — or could be readily tackled by mature-age enthusiasts. It would be ideal as an "achievement badge" for the scouts, guides and other youth groups.

RESTRUCTURING THE LICENCE SYSTEM

The authors of this discussion paper feel a restructuring of the existing Australian licensing system to afford more entry points and more opportunity for experimentation would contribute to a significant revitalisation of the amateur radio service.

We propose four steps to achieve this:

1 Introduce a 'new novice' licence to provide for telephony-only operation on the 70cm band following successful completion of an elementary theory paper, and the standard regulations exam.

2 'Enhance' the current novice licence to add VHF/UHF/Data privileges. The enhanced Novice is in fact an updated Novice licence for the 1980s and beyond (similar to that

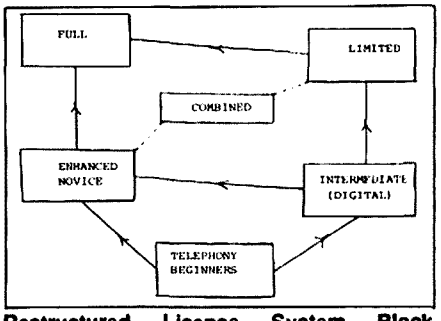
supported by the ARRL — see appendix 1).

3 Introduce an Intermediate (Digital) licence with enhanced Novice-type privileges on VHF/UHF.

4 Remove the 'defined mode' restrictions on the AOCP and LAOCP to permit experimental freedom with 'new' transmission modes. Increase the power output limit. Permit unattended operation by AOCP and LAOCP licensees.

With regard to 4 ... Experiments with 'new' transmission modes, whether currently invented or yet to be devised, would be encouraged. The only limitations necessarily imposed would be those that may be required by the ITU or local DOC in certain portions of the spectrum and by 'gentleman's agreement' within the amateur fraternity. In other words, what we did in- band would be totally 'our business', provided out-of-band emissions met the appropriate standards (as now more-or-less exists under the new Radiocommunications Act). Unattended operation (remote control of a station) would be an integral part of the experimental, public service, and emergency communication aspects of the hobby.

With regard to 1, 2, and 3, this may pave the way for a market for locally manufactured transceivers.



Restructured Licence System Block Diagram

ARRL PUSHES FOR YOUTH, EXPERIMENTATION AND GROWTH IN AMATEUR RADIO THROUGH NEW NOVICE PRIVILEGES

The ARRL has proposed that US Novices be given increased privileges.

Currently they are confined to CW on HF, but the ARRL wants them to have phone, digital modes, repeater access, 220 MHz and a segment of 1.2GHz.

Support for this 'Novice Enhancement' among ARRL members was four to one in favour.

Resistance to granting Novices SSB came from those in fear of CB-type operation being transported in the amateur radio service.

But this resistance was fading away because of the experience (exposure) US radio amateurs had when working many VK-Novices on 10 metre phone during the last sunspot cycle peak.

Some of the points put forward by the ARRL in support of increased Novice privileges are curiously the same as developed by the authors of this paper prior to awareness of the ARRL suggestions.

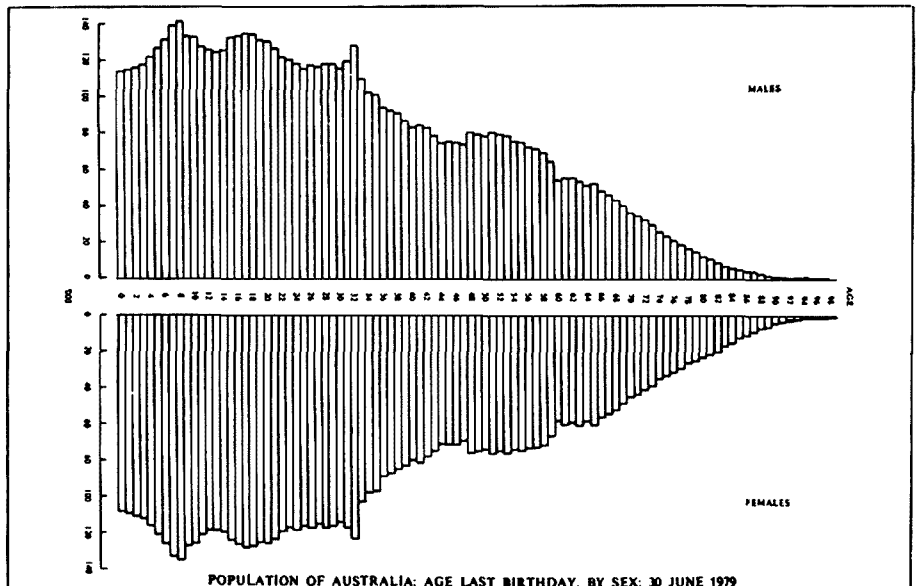
ARRL Executive Vice-President, David Sumner K1ZZ (editorial QST July 1985) said: *"By giving beginners (Novices) the chance to hook a home computer to a amateur rig, we can tap a promising source of prospective radio amateurs.*

"Making the Novice licence relevant to the interests of young people is an essential step if the amateur radio service is to continue, in future decades, to fulfill its basis and purpose.

"The majority of today's Old Timers started in amateur radio when they were teenagers, or younger.

"This early opportunity for hands-on experience with telecommunications technology and concepts shaped many careers and interests in later life, which in turn has benefited the nation immeasurably.

"The particular privileges being proposed for Novices represent a balance between a number of conflicting considerations.



POPULATION OF AUSTRALIA: AGE LAST BIRTHDAY, BY SEX: 30 JUNE 1979

"Ten metre phone and data privileges will permit Novices to pursue these activities ... but are not so attractive as to discourage upgrading.

"We envisage 10 metre gateways to the packet radio market network, to permit Novice participation in this burgeoning activity.

"The sooner we can make amateur radio more attractive to newcomers, without compromising the entrance requirements which are so important in maintaining a quality service, the sooner the future of amateur radio will be assured"

DEMOGRAPHICS OF AUSTRALIAN RADIO AMATEURS

Many of today's Old Timers started in the hobby when they were teenagers, but the number of teenagers in the 1980s is very low.

Of course, this situation is due to more than one factor, but an increase in the attractiveness of amateur radio to a wider range of age groups as proposed in this paper will see increased teenage participation.

A 1984 survey of WIA members showed the following demographics:

AGE GROUP	PERCENTAGE
Below 20 years	1
21 — 30	8
31 — 40	20
41 — 50	18
51 — 60	23
60 and over	29

The survey sample was 5 000. Those aged 50 or over represented 52 percent while in the 30 or under age group it was a mere nine percent.

Compare this with the demography of Australia's population, as depicted in the following Australian Bureau of Statistics graph.

On a population basis there are many more people in the 30 or under age group, and fewer, 60 and over — the reverse of the radio amateur demographics.

Population of Australia: Age Last Birthday, by Sex, 30 June 1979.

OBSERVATIONS ON THE IMPACT OF COMPUTERS

They are increasingly part of the school curriculum from as early as second grade primary.

Short introductory classes and more in-depth courses on computers are very popular because so many people have a thirst for computer technology knowledge.

More than 40 magazines dealing with computers are available in Australia at news-agents — general electronics magazines also contain computer technology articles.

Sales of computers for domestic use are increasing, due to falling prices. They are gradually becoming either a necessity or convenience for education/recreation, and for modern data life-style services access.

Micro-computer clubs have formed to provide a forum for the interchange of ideas and knowledge. They are self-help groups — much in the same way as the amateur radio fraternity traditionally has been.

A revolution is clearly evident in which mechanical operation is being replaced with new technology. Industry recognises it has to adopt new technology to survive.

Conversion of the keyboard written word into synthesised speech has reached a sophisticated stage. Digital storage of speech, is existing technology. Readily converting ordinary human speech into the written word is a reality, practical applications are not far away.

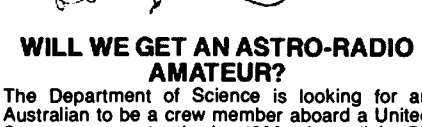
Digital developments in communication and information systems are at the frontier of technology and experimentation.

An

The AUTHORS:
Jim Linton VK3PC, has been the Victorian President and Public Relations Officer of the Wireless Institute of Australia for three years. An interest in shortwave listening and amateur radio saw him join the WIA as a Junior Associate, in 1962. Obtaining a Novice Licence eight years ago, and immediately upgrading to obtain the AOCP, from which he had been earlier diverted. A journalist for 15 years, his special interest is promoting the hobby.

Roger Harrison VK2ZTB, began as a shortwave listener in the NSW Division in 1962, and moved to the Victorian Division in 1963. First licensed as VK3ZRY, in 1963. Written extensively published articles both locally and overseas. Twice winner of the Higginbotham Award for the WIA's AR magazine. A professional technical journalist since 1976, he has edited the journals 6UP, CB AUSTRALIA, ELECTRONICS TODAY INTERNATIONAL, and now AUSTRALIAN ELECTRONICS MONTHLY. Special interests include VHF/UHF techniques, propagation and 'Technology in the Future'.

Work on this paper began in early 1985 and was completed on 7th December 1985.



WILL WE GET AN ASTRO-RADIO AMATEUR?

The Department of Science is looking for an Australian to be a crew member aboard a United States space shuttle in 1988, Australia's Bi-Centennial Year.

If you are fit, healthy, aged 25-40 years, and with the right qualifications to become a shuttle team member, you could become an astronaut!

GO BACK TO HOME BREW

It's the affordable amateur radio!

With the dollar so weak against overseas currencies, imported amateur products are out of many amateurs' reach. Consider the benefits of home brew:

- You supply the labour - so you save!
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- You catch up with the latest technology: otherwise you could get left behind!
- And best of all, you're keeping alive one of the basic reasons for being an amateur in the first place: you have the skill to do it yourself!

HF TRX KIT

80m version supplied — other bands available soon.

Cat K-6330

Ideal for the novice — or the old timer. 12V operated, so it's a great mobile too. Any 500kHz band between 3 and 30MHz 30 watts SSB output and CW or SSB operation. Digital frequency display, complete kit including deluxe moulded case.

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DIGITAL RDF KIT

Here's a great new kit to build — and it will give you a real edge in fox hunts, field days, etc. Uses digital techniques to plot and display direction of any signal. Use in conjunction with virtually any FM receiver (or transceiver). Operates over 50 to 500MHz range (with suitable receiver).

Cat K-6345

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Try these latest kits from DSE:

VZ-200/ 300 RTTY DECODER

The low cost way to go RTTY. Use your VZ-200 or VZ-300, add this decoder, and you're ready for RTTY decoding. Simply plugs into computer's expansion port. Suitable for both amateur and commercial standards.

Cat K-6318

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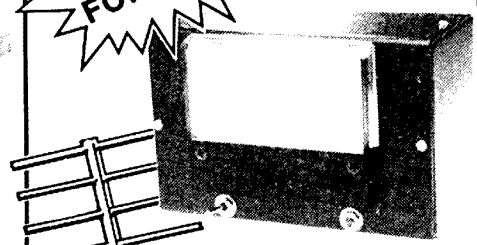

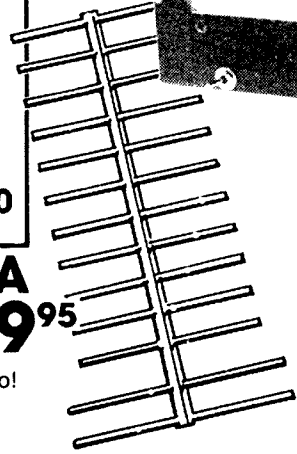

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At last a kit to build a commercial quality Yagi. Everything's supplied — boom, brackets, elements, the lot. 13 elements, 12.5dBi gain. Go on - give it a go!

Cat K-6305

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RG-213 Low-loss Co-ax to suit: Cat W-2099 $2.75 per metre.

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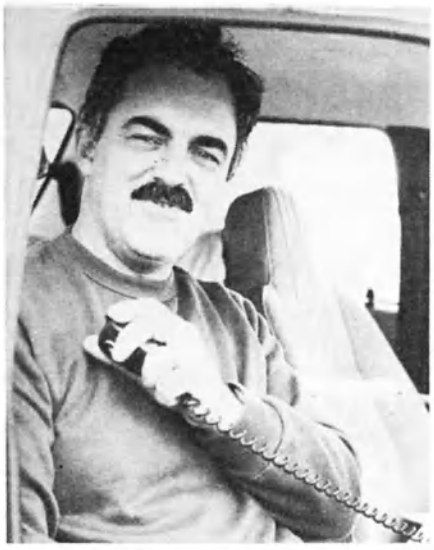
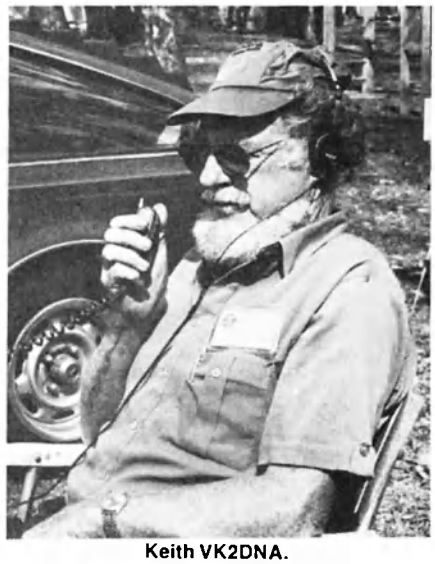
WICEN FACES AT THE RIVER MURRAY MARATHON

Alan VK3DXF.



Richard VK3KCP.



Keith VK2DNA.

Neil VK3XNX.

Adrian VK3DAW.

Margaret VK3DML.

David VK3YDM.

Ron VK2EFJ operating and Dave Waters of LROC taking a message.

Brenda VK3KT.

Photographs courtesy G I Sones VK3AUI

One of the many checkpoints, with Sam VK5TZ operating.

Adrian VK3DAW and Bruce VK3JX.

Les VK3BPW.

Leo VK3YPK nad Alex VK3BQN.

Ron VK2EFJ.

Band Planning for the High Frequency Bands

Ron Henderson VK1RH
171 Kingsford Smith Drive, Melba, ACT 2615

A previous article discussed the philosophy behind band planning but deliberately raised only a few of the wider considerations requiring resolution by the amateur community.

This article, devoted to consideration of the high frequency amateur bands, considers the issues arising in some detail and presents draft band plans, in pictorial form for consideration, comment, adjustment and finally endorsement by Australian amateurs.

Before considering each particular band, the concept of an overlaid band plan should be explained. We commence with the amateur allocation as a slice of the total electromagnetic spectrum, as shown in Figure 1a. This allocation can be divided into a telegraphy-only segment and a joint telegraphy/telephony segment. For ease of definition let us call these the CW segment and the CW/wide band mode segment. Note that our basic Gentleman's Agreement; that CW is permitted across the full band allocation whilst the wide band mode has a narrower allocation; is preserved by layering the wide band mode segment on top of the CW allocation as in Figure 1b.

Within this basic division provision can be made for varying bandwidth requirements, again built up as layers on the original CW/wide band delineation. Narrow band modes appear as a subdivision of the CW segment and effectively reduce the CW only allocation through super-positioning as shown in Figure 1c.

Finally, the band plan can be developed further by addition of yet another layer devoted to specific application considerations, such as weak signal working, beacon bands, FM simplex, and repeater allocations. These are demonstrated in Figure 1d.

Development of an Overlaid Band Plan — The stages in the development of an overlaid band plan are shown diagramatically below. NOTE: This is for illustration and does not resemble any band (perhaps it is nearest to 144-148MHz.

Figure 1a.

Figure 1b.

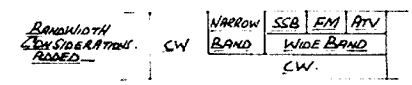


Figure 1c.

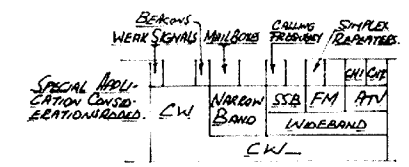


Figure 1d.

Before proceeding, it is necessary to establish some definitions applying to modulation mode bandwidth. The WIA Call Book states that:
"The following terminology has been adopted for the purpose of the Australian Band Plan.

1 CW Only

2 Narrow Band Modes (other than CW) — for example occupying bandwidths less than 2.5kHz such as ASCII, Baudot (RTTY), AMTOR (ARO FEC) and Packet Radio.

3 Wide Band Modes — such as for example SSB, FM, FAX, SSTV, and data transmissions at greater than 300 Baud."

By contrast, the IARU bandwidth interpretations are:

a Phone operation includes SSTV, FAX, and modes with similar bandwidths not exceeding 6kHz.

b NB designates narrow band modes including CW, RTTY, Packet Radio, and modes with similar bandwidths not exceeding 1kHz.

c WB designates wide band modes including FM.

The WIA Call Book definitions have been used for the remainder of this paper, even though they may require updating.

The term "exclusive allocation" indicates a single allocation to the Amateur Service in Australia. It does not take into account assignments which may be made in other countries to other services (the 7.000-7.100MHz and broadcast station problem is an illustrative example).

Having set the scene by explaining the overlaid band planning approach, it is time to turn to specifics. In the HF band plans that follow, very few features are new or innovative, but a few do aim to clarify current misunderstandings. The basic CW/wide band mode delineations are generally not altered, except perhaps by the insertion of a narrow band segment. The amateur band status, as indicated by the Australian Table of Frequency Allocations, is also included for information at the foot of each figure.

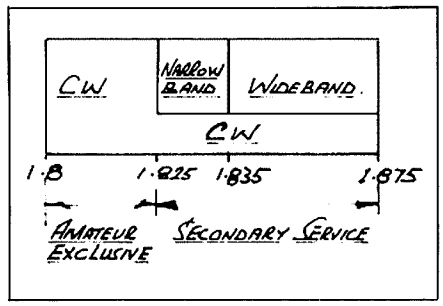


Figure 2. 1.8MHz

The 1.8MHz band, as shown in Figure 2, is quite straight forward with the narrow band mode segment layered between the CW and wide band mode assignments.

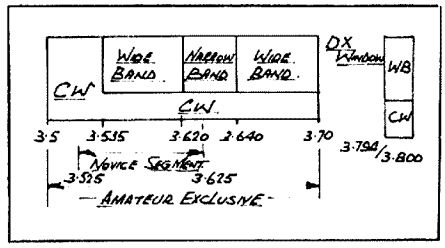


Figure 3. 3.5MHz

The 3.5MHz band, as shown in Figure 3, is similarly straight forward except for the addition of the DX window between 3.794 and 3.800MHz. The narrow band segment is overlaid in the wide band assignment from 3.620 to 3.640MHz. This provides minimum intrusion into the Australian novice segment, yet is adjacent to the Region 1 teletype allocation of 3.580 to 3.620MHz. As yet, Region 3 has not produced a plan for this band.

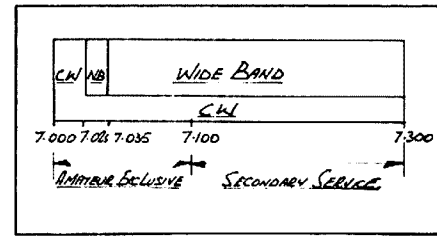


Figure 4. 7MHz

The 7MHz band is shown in Figure 4. Again, the narrow band mode segment is layered between the CW only and CW/wide band assignment at 7.025 to 7.035MHz. This accords with the Region 3 band plan and abuts the Region 1 allocation of 7.035 to 7.045MHz.

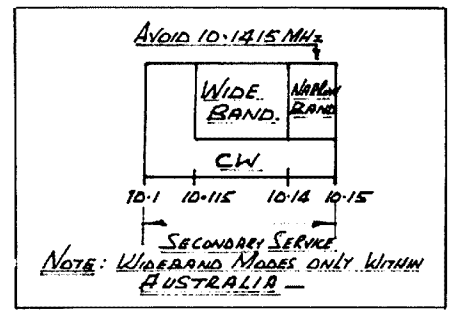


Figure 5. 10MHz

The 10MHz band poses our first dilemma as shown in Figure 5. The Australian authorities permit wide band modes in this narrow amateur allocation and Australian amateurs have seen fit to utilise this privilege, for it is a useful band for interstate contacts, as well as DX. The recommended usage for wide band modes is within Australia only, but the amateur community may wish to establish a Gentleman's Agreement to not use wide band modes (phone) at all. Note that the narrow band overlay completely aligns with the Region 1 RTTY segment. Region 3 has opted to permit narrow band operations across the full band allocation.

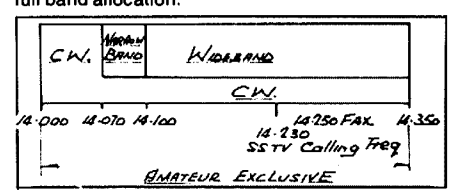


Figure 6. 14MHz

The 14MHz band has traditionally been the international DX band, the band usage plan is shown in Figure 6. Note that the narrow band mode segment sits between the CW only and CW/wide band segments. Its lower end at 14.070MHz accords with the Region 3 band plan and it aligns approximately with the Region 1 lower limit of 14.075MHz. The upper limit extends to 14.100MHz minus the guard band for the beacons on that frequency. The International Beacon Project (IBP) has a world wide series of beacons on the common frequency 14.100MHz and an

appropriate guard band of ±500Hz in Region 3 is allowed about that point.

Identification is by a time division process, each beacon having its own allocated radiation time interval. Two commonly used calling frequencies for wide band modes (SSTV and FAX) are also indicated on the figure.

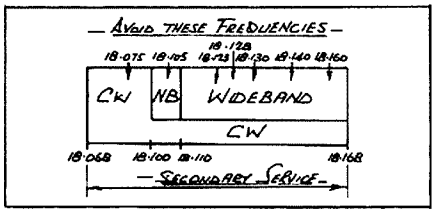


Figure 7. 18MHz

Another of the WARC 79 bands, the 18MHz band is shown in Figure 7. Here the band plan mirrors the Region 3 and Region 1 plans but note should be taken of the number of spot frequencies which Australian amateurs must avoid until this band becomes an exclusive amateur allocation in the, we hope, not too distant future.

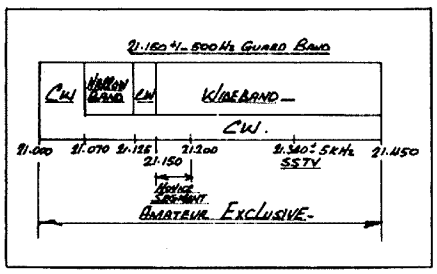


Figure 8. 21MHz

The second international DX band, 21MHz, is shown in Figure 8. Here the narrow band mode segment follows the Region 3 plan and has been overlaid on the CW only segment, (as determined by earlier Gentleman's Agreements) to achieve co-incidentally a total overlap of the Region 1 allocation, yet avoid intrusion into the quite narrow Australian novice sub-band. Provision is made at 21.150MHz for an IBP time-shared beacon system with an appropriate guard band. This is at the boundary between the CW exclusive and CW/wide band assignments.

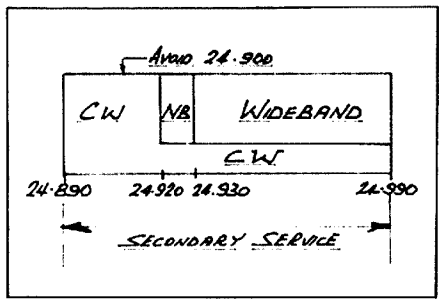


Figure 9. 24MHz

The third WARC 79 band, 24MHz, is shown in Figure 9. Once again the Australian band plan mirrors the Region 3 and Region 1 plans to achieve maximum commonality in such a narrow allocation. A single spot frequency must be avoided by Australian amateurs until this band also becomes an exclusive allocation.

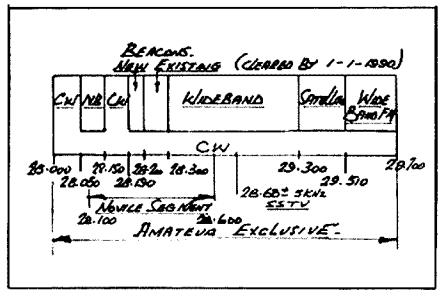


Figure 10. 28MHz

The largest amateur HF band is the 28MHz band, shown in Figure 10. There are a few international implications to planning the use of this band, in particular, the existing beacon sub-band from 28.200 to 28.300MHz and the satellite downlink sub-band from 29.300 to 29.510MHz. Here again the narrow band mode segment aligns with Region 3 and Region 1 and is overlaid on the CW only segment.

The proposed International Beacon Project sub-band of 28.190 to 28.200MHz will contain a primary world-wide time-sharing system on 28.200MHz and a series of secondary continental time-shared systems in the remainder of the sub-band. Australia should anticipate one primary beacon and up to ten secondary ones. It is proposed to clear the existing 28.200 to 28.300MHz beacon sub- band by 1st January 1990, this will free up band space for Australian novices. Unfortunately, the lower limit of the novice sub- band overlaps the narrow band mode segment (a mode not available to novices for transmitting) but despite these constraints, a clear 400kHz is left for novice CW/phone operation from 28.200 to 28.600MHz, as well as a CW only segment.

As yet no allocations have been planned in Australia for channelised FM repeater operations at the top of the band as there has been little demand for it. Never the less, at the peak of sunspot cycles, international contacts occur and an allocation aligned with Regions 2 and 3, namely 29.510 to 29.700MHz may be prudent planning.

Within Australia we are fortunate that DOC has adopted a most co-operative approach and permits a degree of self-regulation, much greater than in many other countries. For example, the US is constrained by legislation to frequency segments for differing modes; furthermore, those allocations vary with licence grade (and they have nearly double the number of grades we have in Australia). With such a large amateur population, the US has therefore materially influenced the development of a Region 2 Band Plan which is significantly different from the requirements of the other two regions. This results in a closer alignment of Regions 1 and 3 Plans as reflected in this paper.

This paper has presented revised Australian amateur HF band plans and the reasons behind that planning, much arising from the recent IARU Region 3 Conference. The plans do differ in detail from the WIA Band Plans, as published annually in the Call Book.

It is now left to you, the amateur, to register you acceptance of these draft plans or to record your dis-satisfaction with any features through the columns of this magazine, through your WIA Division, or Divisional Federal Councillor, or by writing to the WIA Federal Technical Advisory Committee. The last named will co-ordinate comments and present an appropriate recommendation for endorsement by the next Federal Convention. Above all — if you have something to say present it in the right quarters, do not bad-mouth to all and sundry on air without doing something positive.

VK1RH Revised 30th December 1985 incorporating comments from Allan Foxcroft VK3AE)

AR

REVERSE REPEATER FOR THE FT-480R

Russell Lemke VK3ZQB
22 Villiers Street, Port Fairy, Vic. 3284

After reading the article in August 1985 AR by Sam Pascoe VK6KSP on a reverse facility for the Yaesu FT- 480R, the writer decided to implement these modifications to his own 480. It concerned him that the operation of the switches under the rig were a little messy and if the same function could be operated from the microphone, it would be much easier and quicker to select.

Sam's lead was taken to see what control voltages were present on the wires around the satellite switch. The purple wire was disconnected from the satellite switch and, after due probing with the meter, it was found that the purple wire went low when the tone button on the microphone, or on the front panel, was depressed and the receiver shifted to the reverse frequency.

The green/white wire went low when the PTT was depressed but transmission was inhibited due to the absence of the purple wire from the switch. To achieve transmit, both purple and green/white wires had to be connected together via the switch so that when the green/white wire went low the purple wire did so as well.

By the insertion of a diode (1N4148) between the purple wire and the satellite switch the functions were separated. A pull-up resistor to +5V is also required. If the tone button is depressed the transmitter is not activated and the receiver is shifted to the reverse frequency set by the offset switch.

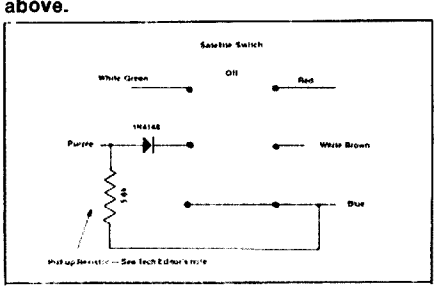
If both PTT and tone are pressed simultaneously the normal function of transmitted tone is operational.

This modification does not interfere with the operation of the switches so that ail the design functions of the set are retained.

TECHNICAL EDITOR'S NOTE: There appear to be some variations between FT-480Rs. Readers should check for differences. In this case the need for the pull-up resistor may vary between rigs.

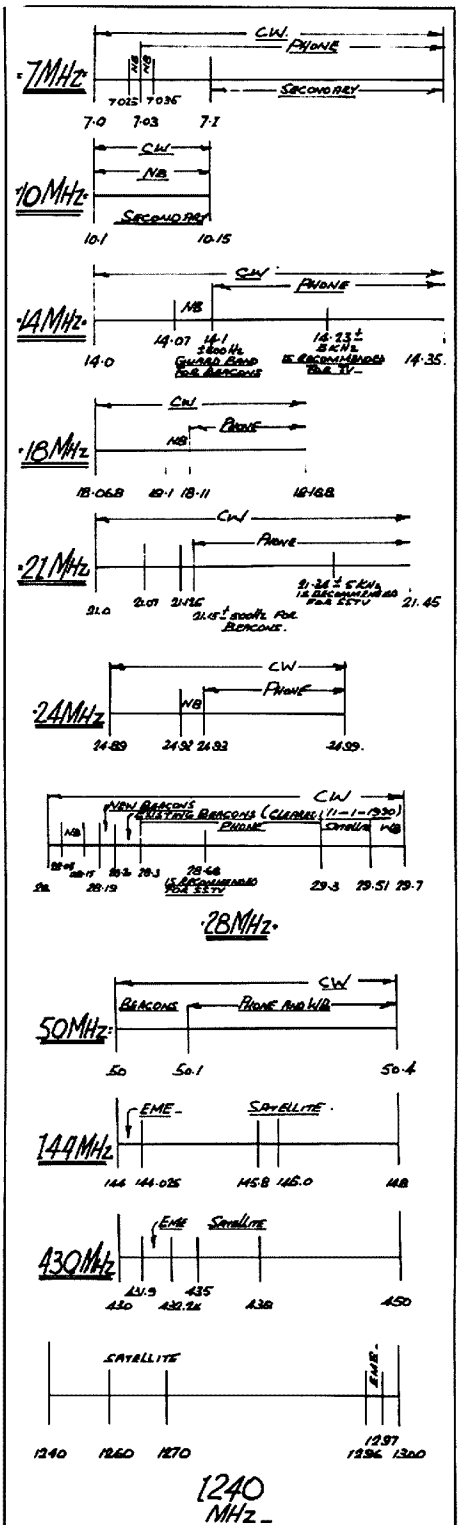
AR

Diagram of Modifications to FT480R for Reverse on-Tone Button. NOTE: Remove purple wire and connect via diode as shown above.



IARU REGION THREE BANDS PLANS

Ron Henderson VK1RH
171 Kingsford Smith Drive, Melba, ACT. 2615



At the recent IARU Region 3 Conference in Auckland, a Working Group was set up to develop Region 3 Band Plans. The report of that Working Group, which was adopted unanimously by the Conference is precised below.

The Basic Principles underlying the Region 3 Band Plans are:

a In all cases of conflict between a band plan and the national regulations of a country, the latter shall prevail.

b Nothing in these band plans shall be construed as prohibiting different national arrangements, provided that harmful interference is not caused to stations in the countries operating in accordance with the regional band plan.

c Notwithstanding item b above, member societies of Region 3 are strongly urged to use these regional band plans as a basis for their national band plans.

Plans were developed for the bands from 7MHz to 1300 MHz inclusive and are shown in graphical format. In interpreting these band plans, the following notes apply:

a Phone operation includes SSTV, FAX, and modes with similar bandwidths not exceeding 6kHz.

b NB designates narrow band modes including CW, RTTY, Packet Radio and modes with similar bandwidths not exceeding 1kHz.

c WB designates wide band modes including FM.

d Segments marked SATELLITE should be kept clear of other operating modes.

e EME includes other weak-signal propagation modes, ie Meteor Scatter and Auroral Scatter.

f Secondary at 7.100 to 7.300MHz means that amateur stations shall not cause harmful interference to stations of the Broadcasting Service.

g When Packet Radio is used for experiments in which speech liaison is required on the same frequency, the phone segment will be used. However, where the transmission is narrow band only, eg bulletin boards, the NB segments may also be utilised.

h In planning VHF/UHF bands only those activities which were of an international nature, ie intentionally radiated beyond a country's boundaries, were considered as requiring co-ordination within the Region.

Concerning the 1.8 and 3.5MHz bands, the Working Group recommended that the Secretary IARU Region 3 ask all member societies to submit their detailed band plans for these two bands prior to the next conference and that two papers be prepared, detailing current plans for each band. A Working Group could be established at the next conference to consider regional plans for these two bands. These plans will also support future WARC preparations.

The Working Group had no recommendations for bands above 1300MHz.

The Working Group recommended that societies consider the need for a narrow band at 190kHz for experimental purposes.

AR

SPEECH AID DEVICE

A portable speech aid has been developed at the University of Queensland to help the vocally disabled "speak". It has the potential to produce high quality speech, rather than the robot-like sounds often found in other similar devices.

UniQuest Limited, the University's contract research company, is presently evaluating the speech aid's marketing potential.

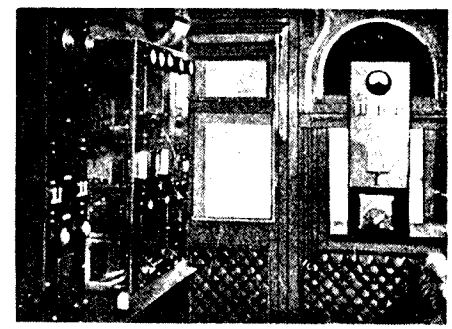
LOVE FOR TRAINS

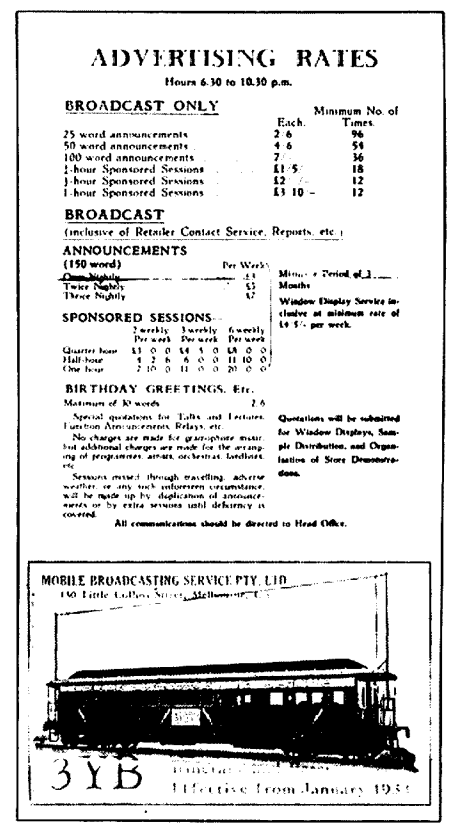
Being somewhat of a "fan" of the early history of the then mobile broadcasting station 3YB, it was with interest I read the article in November's AR, page 27.

I, unfortunately do not have much in the way of paper information, most of what I have learnt is from a personal approach to those who have had knowledge. I have spent a very enjoyable afternoon with the gentleman mentioned in the article, Mr Harry Fuller. Apart from the information about the radio station on wheels, Mr Fuller was an extremely interesting person himself with his experiences of early radio days.

Pictured are photocopied portions of an information brochure for 3YB. On the reverse side of the brochure is an itinerary for 3YB for 1934.

Contributed by Colin Gracie L30060





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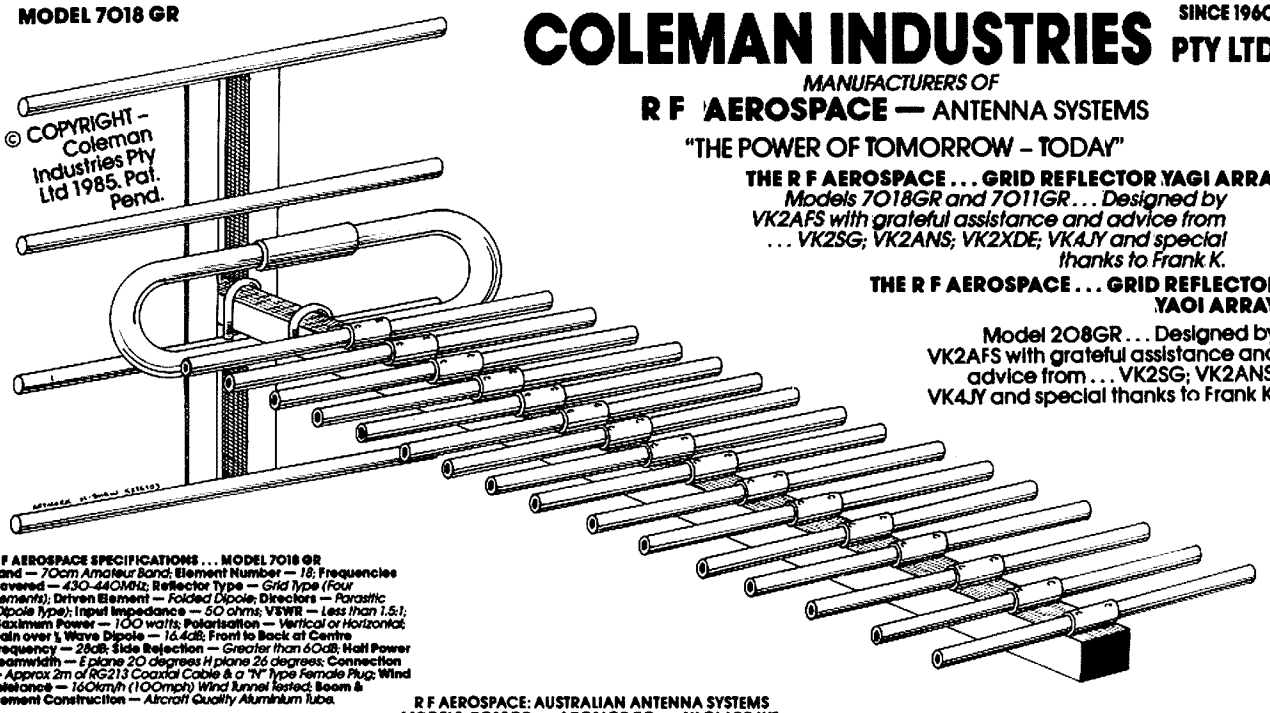

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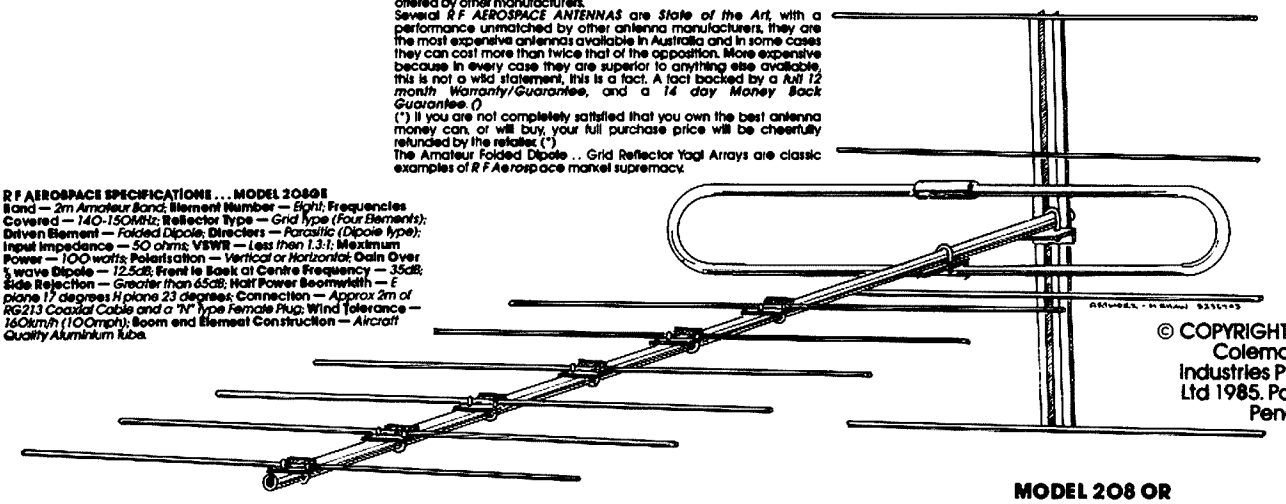

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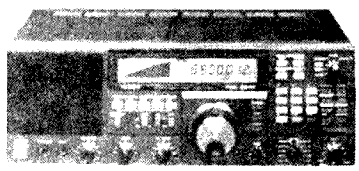

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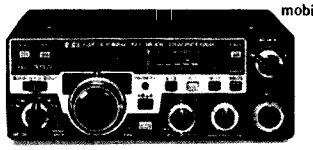

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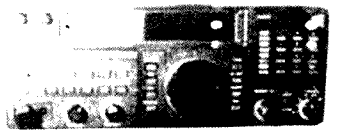

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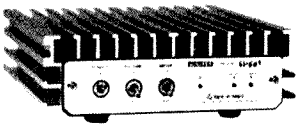
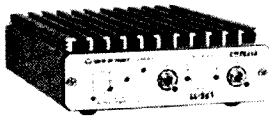


Also HL-62V 2m, 10-60W $249

HL-35V 2m . . . $159
3W-30W, GaAsFET preamp.



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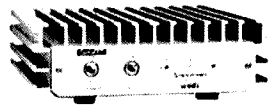

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50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JO1YAA	*Japan*
51.020	ZL1UHF	*Mount Climie*
52.033	P29BPL	*Loloata Island*
52.100	ZK2SIX	*Niua*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.325	VK2RHV	*Newcastle*
52.370	VK7R8T	*Hobart*
52.400	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.470	VK7RNT	*Launceston*
52.490	ZL3SIX	*Blenheim*
52.510	ZL2MHF	*Upper Hutt*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.465	VK6RTW	*Albany*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.480	VK8VF	*Darwin*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.425	VK3RMB	*Ballarat*
432.440	VK4RBB	*Brisbane*
1296.171	VK6RBS	*Busselton*
1296.410	VK1RBC	*Canberra*
1296.420	VK2RSY	*Sydney'*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

(1) Advice has been received from John Marshall VK2EGI, the VK2 Beacon Officer, that the latest addition to the NSW Division's Beacon Stations is VK2RSY, one 1296.420MHz and commenced operation on 3rd November 1985. Power output is approximately five watts to an Aiford Slot antenna at 30m (100 feet). The antenna is horizontally polarised with a virtually omni-directional radiation pattern, and is believed to have considerable gain over a dipole. The beacon should provide good coverage of the Sydney area and hopefully will be heard in New Zealand under favourable conditions.

Reception reports are requested and should be sent to: The Beacon Officer, WIA, Box 1066, Parramatta, NSW. 2150. All stations which QSL will receive a QSL card from VK2RSY.

Details of VK2RSY are: 26.262MHz 25 watts vertically polarised; 52.420 and 144.420MHz each 25 watts; 432.420MHz 15 watts; and 1296.420MHz five watts. The last four are all horizontally polarised.

Regarding VK2RCW, I have taken a chance and amended the frequency to 144.950MHz, in accordance with the article in September's AR, but no actual advice of the change has arrived here. Power was to be increased to 25 watts, as well.

THE VHF SCENE

There is a lot to write abut this time due to the early closing date for copy for the January issue, thus a number of letters were just too late for inclusion. As a result, some information has become dated, but we will dispose of the letters first and deal with the band update further along.

Graham VK8GB, in Darwin, is included in the SIX METRE STANDINGS for the first time with a very *impressive* total. He has also sent *me some* photographs he took during his visit to the USA in 1983. I plan to use some of these during the next few months, but would like to start with a photograph of Bill Tynan W3XO, who is my counterpart in the US and conducts the OST's WORLD ABOVE 50MHz. Bill and I have been shuffling information backwards and forwards to one another for quite a few years, so from my point of view, it is pleasing to see the other man!

Bill Tynan W3XO.

Graham has also enclosed a picture from his old friend, Hide JA4MBM, who sent several views of his mountain top antenna system, near Hiroshima. Graham comments: *"You can see now what it takes to be Number One in the world on six metres! You wouldn't catch me on top of that tower!"* VK5LP wouldn't be there either!

Details of the system are: *Situated on Mount Noga at 733m, tower 39m high, mast is nine metres long and 114.5mm in diameter, stacking space 6 or 7.4m, boom diameter 60,5mm, and the antennas are the KLM 50-52-11 with a Emoto 1105MX rotator.* This system has given Hide a total of 76 confirmed countries.

Graham VK8GB, has included a photocopy of his log from 1st January to 21st September 1985 and this brief summary will show just what we don't get in the way of VHF contacts by living in southern areas! 1/1/85 — 17 contacts to VK6; 16/1 — VK8ZLX; 7/2 — 2 x VK4; 2/3 — JA4MBM; 25/3 — 5 x JA; 3/4 — 37 x JA, plus JA6 and JH4 on 144.100MHz; 4/3 — 2 x JA; 5/4 — 19 x JA; 6/4 — VS6CT; 7/4 — 2 x JA; 8/4 — 3 x JA; 9/4 — 29 x JA on 144.100MHz and included JA4, 6, and 8 districts; also two were worked on 50MHz; 13/4 — 3 x JA; 14/4 — JA4MBM; 28/4 — 36 x JA plus JA4SXA on 144; 29/4 — VK5ZDR, VK8ZLX; 30/4 — 5 x JA; 13/5 — 13 x JA; 2/9 — JA4MBM; 15/9 — 25 x JA; 16/9 — JA4MBM and 21/9 — JG2COF Signal reports on 144MHz varied from 5x1 to 5x9, power used was either 20 or 200 watts. Many of the six metre contacts were made with 20 watts.

A letter from Graham, which arrived just too late last month, indicated he had heard a new beacon signing JA6YBR, on 50.020MHz. The call sign indicates it as being a club station on Kyushu Island, but it is not known whether it is an attended keyer, or a beacon, although the frequency tends to support that it is a beacon. (I shall await further information . . . 5LP).

On 7/11, VK8GB had the first Es opening for the summer, between 0930 and 1015, working VKs 7FB; 4OF; 8ZLX; 8TM; 8GF; and 8KTM, all Alice Springs. In Darwin, VK8ZWM and VK8ZRJ were also active.

Graham has been monitoring the 10 metre beacons and finds them useful indicators for an impending six metre opening. Thanks for the news Graham.

Two letters have come from Peter VK3DU, the first on 7/11, which indicated the first Es for Melbourne for the summer, the same date indicated by VK8GB. Stations were worked in Sydney, Newcastle, Walcha in Central NSW, and Bundaberg. Peter runs 10 watts to a three element Yagi, at 10m (35 feet).

A further letter from Peter, on 12/12 shows that on 7/12, he worked P29BH at 2326; 10/12 2230 ZM8OY and ZL1AON; 11/12 0029 FK8EM; 0108 YJ8RG and 0134 FK1TK. This must have been quite a day for Melbourne as Peter said he worked five countries (including VK) in two and a half hours, with the ZL television stations giving an indication of things to come. The Pacific countries stations drifted in and out with changes in propagation, and it appeared only necessary to stay around for a while to work all three that were available.

FK8EM was S9+ for a short period. FK8EM also said ZM8OY has a lunch break from 2200 to 2230UTC and always calls and listens on 52.050MHz at this time. Peter also said that he had been advised that the P29BPL beacon was on 52.020MHz — I have not heard it so far so I am unable to confirm or deny . . . 5LP. Thanks for the letters Peter, by now you should have worked much more.

A short letter from Eric VK3BXA, indicates his first Es contact for this season was on 9/11 and was to VK4FWA at 0150, in Ayr. Signals were 5x9, but then the band promptly closed. At 2333, it was Ayr again with a contact to Ron VK4FTJ, but it was again of short duration. This seems a typical pattern during the early stages of the Es summer period. Thanks for writing and you will have had many more contacts by now also Eric.

Ken VK2BNN, sent In his six metre standings and added his station is a FT620B and a 60 watt linear to a four element 12m high antenna. Ken included a photocopy of his QSL from WA4TNV/KL7 which was for a contact on 13th March 1979, and on the back Clay has indicated this was his first VK contact ever on six metres. Steve VK3OT has further stated that this was the first ever VK2 to KL7, six metre contact. Clay reported that the band was open for two and a half hours and he had 39 overseas contacts in that time.

A brief telephone message came from Eddy VK4KAA (ex VK4ZEZ), who finished up in Mount Isa, after travelling via Melbourne and Ipswich! Monitoring OSCAR-10, six and two metres. During an inversion over the Coral Sea before leaving, he had had a good two metre contact to Port Moresby, via the repeater, using his hand-held. Also, AMTOR RTTY to Cairns on two metres, all helped by the VK5 designed pre-amplifier.

While still on the letters bank-up, one has come from Toshio JR8XPV, thanking me for confirming his contact with VK0AQ, at Mawson. His home town of Honbetsu is only small he says, 13 000 people, placed among low mountains and not really good for VHF However, he has worked 55 DXCC countries via AO-10, but still needs South America. He operates all bands from 3.5 to 432MHz using phone and RTTY. He does have some problems with the beam antennas due to Ice — most winter temperatures are around -10 degrees, with the lowest last year -40 degrees, so that is cold.

David VK2BA, sends his amended list of six metre countries and adds that Chris ZM8OY, made good use of a tremendous opening on 10/12 to work into VK2, 3, 4 and VK8GB. David said he was hardly brave enough to take his beam off Kermadec until he had worked him! (Maybe VK5LP was lucky, but ZM8OY called me saying I was his first VK5 and he was looking for a contact! I) On 7/12, P29BH caused a local pile-up when he came through at around 2250. YJ8RG and the FKs have added to the interest of those early openings.

David is pleased to report that in Sydney, at least, most operators seem to be observing the importance of leaving the 52.050MHz call frequency relatively clear of QSOs, although there

are those who still remain there. Hopefully the extra publicity which has been given through these columns to do what you can not to clog up that frequency is having an effect. From my observations here in VK5 last year, most operators are very fair in their use of the call frequency and if the improvements continue as noted between last year and this year, there should not be a great deal of trouble in the future. The same treatment must also be applied to 144.100MHz, which may be continuing to suffer more than 52.050MHz.

Gil VK3AUI sends his updated countries list. He advises that the six metre gear is being brought back from Macquarie Island and the amplifier from Willis Island.

Looking top the future, Gil says he, Lionel VK3NM, and others are continuing to look at what might be considered good DX- pedition locations where the equipment might be used. Whilst agreeing that six metres is probably of prime importance, he says we should not be overlooking the possibilities on two metres, but acknowledges this would require a more dedicated type of operator than is required for six.

Certainly I believe that since the FK stations have had a taste of two metres, there is a likelihood of more interest in that band out in the Pacific, so it is likely that eastern seaboard stations will have further countries to add to their list in the future.

SPORADIC E IN 1985

Well ! ! ! Just how do you describe what has, so far, happened on both six and two metres (up to 23/12 at this first writing. There may be some further coverage if it can be organised in time for the Editor!). There certainly has not been anything quite like what has happened on six metres, and so consistently, for quite a long time.

Possibly 1963 would be similar but then our areas being worked did not extend beyond VK and ZL, although there were many occasions when operators worked over 100 stations in a day, and from all States too.

Of course, in the past, I have picked up on the point of suggesting that it seems Es does improve during the low part of a cycle, or between cycles, but if 1985 is an example, then I am not too far along the wrong path! The incredible number of openings to New Zealand are an example of the consistency of the Es, and the widespread coverage the ZLs have been achieving indicates vast areas of ionisation, their signals extending right across Australia. And isn't it great to have some contacts thrown in from the Pacific islands. YJ8, FK1, and FK8 have just whetted the appetite, and then, of course, the cream was added with VK9ZB and ZM8OY. Also, some people worked P29. It has all been so exciting.

Before we get down to some specifics, what about two metres? Day after day, around mid-December, there were across border contacts in VK, often extending to 2000km, and with almost continuous possibilities to someone with so many signals being heard and worked from ZL — to VK1, 2, 3, 4, and 7, and being heard in VK5 but, so far, not being worked. And then the highlight came from that tremendous activity.

WORKED ALL STATES ON TWO METRES

It took many years, but finally it was done. There have been a number of stations around VK just requiring one State to complete a Worked all States on two metres, and most operators were needing a VK8 contact, especially those who live in VK5.

At 0428, on 16th December 1985, VK5LP and VK5RO both worked VK8GF in Alice Springs to give both of them WAS on two metres! The scenario started off, it seems, with the Alice Springs repeater channel 8 being off, and Jeff VK8GF hearing a burst of information from the channel 8 repeater in Adelaide! He was working Col VK5RO on six metres and they agreed to try two metres. VK5LP was standing by to work Jeff on six as soon as Col was finished, so decided to look on two metres also. Calling took place at first on CW and although signals were being heard in both directions they were not good enough to allow a two-way contact to be completed. After a few minutes, conditions improved to make SSB possible. Initial reports at VK5LP were 5x4 sent and 5x5 received, and somewhat similar to VK5RO. Soon after Jeff was 5x6 at VK5LP and I received 5x9 from Jeff, with a lesser report to VK5RO. Soon after this second exchange of reports the signals from Jeff faded out at VK5LP, but they appeared to stay for a while longer with Col who was again trying CW.

Needless to say, both Col and I were thrilled to have worked Jeff as it gave both of us Worked all States on two metres, Col having been trying for 30 years and I for 25 years to achieve this! But what is more important is that both of us achieved this from the same home QTH without the need for portable operation to finally get there, and this alone makes the final result just that much more acceptable in proving that it is possible. This will also give added incentive to others to keep on trying to achieve the same goal.

In the process of trying to achieve WAS, VK5LP has worked about five stations in VK1, ten in VK2, well over 100 in VK3, 10 in VK4, numerous VK5s, six in VK6, four in VK7, and now one in VK8, all either using AM, CW, or SSB depending on the era at the time! The next goal on that band is to work New Zealand and some of the Pacific islands! Another goal, of course, is to achieve WAS on 70cm and so far I have VK2, 3, 5, 6, and 7, leaving VK1, 4, and 8. This will not be readily brought about due to the high losses through the hills which surround me and it may be necessary to resort to portable operation from near my home , but that can be decided as the occasion permits.

Finally, credit for starting the proceedings leading to the two metre contacts must go to Jeff VK8GF and Col VK5RO, who were confident enough to try. I must admit I did not feel conditions were quite right but one never knocks back a chance on two metres, so fortunately I was standing by at just the right time on six metres and was thus able to join in on two metres. Signals at the time on six metres were very strong to Alice Springs but there seemed to be an absence of short skip which is the usual pointer to a higher than usual MUF

A similar set of conditions prevailed on 18/12 around 0710 when six metres was very strong to Brian VK2AKU and Barry VK2KAY. They asked me to try two metres and were able to hear my CW, and I heard theirs, but again no two-way contacts. At 0720, Doug VK2XDH came into the fray and asked to try two metres. He called and there he was, I sent 5x4 and received 5x3 and we exchanged Ross Hull numbers, too.

SIX METRES — MOSTLY

It is not my intention to give a blow by blow description of what has been going on since the summer Es period really got under way around the middle of November, literally there has been so much activity that it would be futile to try and adequately cover the events. All Australian states, all ZL districts and some of the Pacific island countries have been involved with contacts in all directions. The scene has been reminiscent of 1963 which I always considered to have been one of the greatest Es years, perhaps assisted by the fact that Channel 0 was not around to cause problems and we were still able to use 50MHz. Given the present day reductions in activity, due to TV stations, the past month must go down as one of the all time greats, and it will be interesting to see if next year will be as good. Despite a certain amount of flak, I have always stuck to my opinion that Es seems to be more intense and widespread during the low part of the sunspot cycles and in the light of 1985, there seems little need to modify that opinion!

The intense Es has brought with it a large increase in the right conditions for two metre contacts right across the nation with stations almost 2000km apart participating, and including countless contacts across the Tasman to New Zealand, and even Noumea has been included! I didn't notice too much of this sort of thing happening during the flush of long distance six metre activity of 1979/80/81 etc, a period which could be considered around the peak of Cycle 21.

May I say for the benefit of our overseas readers, that Australia and New Zealand in 1985 has been experiencing one of the most outstanding and rewarding Sporadic E periods known, and if the long distance contacts on both six and two metres could be counted they would run into thousands! According to my own log book, I have operated on 13 days during the past month for 137 contacts with some days only one or two contacts as circumstances allowed, others with 30 or more contacts, and I have not been pushing for contacts contest style, but content to talk to old friends. It has just been that easy. Quite a few stations have only been running two or three watts, many others 10 watts, but signals have still been 5x9 for 1609km (1000 miles).

It has been good to see increased activity from VK8 with VK8GF, VK8KWB, VK8LF, VK8ZLX in Alice Springs, VK8ZCU in Tennant Creek, VK8GB, VK8ZWM, and VK8ZRJ from Darwin being amongst the more active stations, as monitored here.

Early in December, Ron YJ8RG from the New Hebrides started giving us contacts and could be heard working stations at all odd moments. Then along came Kim VK9ZB on Willis Island who gave many stations a new country before he had to pack up and leave soon after 10/12. While he was around we also had P29JB from New Guinea, soon to be followed by Chris ZM8OY on Kermadec Island, north of New Zealand, who caused many a heart to flutter in anticipation of a contact. While these fellows were thrilling all and sundry, FK8EM, FK1TK and others in Noumea were adding to their scores, even to having two metre contacts occasionally. Then on 20/12 within a very short period of arriving on Norfolk Island, Nev VK9LC fired up from his hotel room running 10 watts to a whip antenna and proceeded to work all and sundry. He was up to 5x9 in VK5 and when VK5LP worked him, also received 5x9, for another new country.

He proved a bit frustrating to the VK2 operators close to the coast as he was too close for the propagation available. Subsequently however, mainly on 23/12, the skip shortened and he supplied the needs of the Sydney gang and others in VK2 not already satisfied with a contact.

The FK stations continued to pile-up contacts, especially to VK3, have been heard in VK5, but not so far worked, I believe. A Victorian report suggested it may be possible to work A35, T32, 5W1, and FO8, as these areas were being aroused by the reports of so much VK and ZL activity.

It would be difficult to pin down any one day as being substantially better than the next best, but perhaps 7/12, when from the VK5 viewpoint six metres was open to all Australian states, plus ZL. 8/12 had some good short skip to VK3; I worked Lionel VK3NM in the backyard of Les VK3ZBJ's QTH, leaning on the bonnet of his car with an IC-502 and whip, with 5x9 reports. 16/12 was a good day too with YJ8RG being available for hours, FK8 heard, ZM8OY worked, VK3 on back scatter, and Max VK2ZQA asking me to provide a new S meter for his rig despite the ⅝ whip he was using! Throughout ZLs were being worked constantly, particularly so the next day, 17/12, when there were very prolific. The Es cloud was still performing well on 18/12, with contacts to VK2 and 4 on two metres (as also for the previous five days, as well). I worked VK2XDH at 0720 on 144.100MHz, SSB, while Brian VK2AKU and Barrie VK2KAY could hear my CW and I theirs, but we could not make two way contact. Widespread contacts continued on 20/12, with the ultimate being Nev VK9LC at Norfolk Island, who seemed somewhat astounded at the signal reports he was receiving particularly from the greater distance of VK5. Things were a bit quieter over the weekend of 21 and 22/12, but livened up again on 23/12, with VK9LC worked again here, also plenty of ZL activity, plus VK2, 3, 4, and 7.

Anyone who has not had some real thrills from six and two metres this season would be hard to please. Of course, I cannot hear everything which transpires on a crowded band, nor what might be happening to areas not open to me at any one time, but I must say I am very pleased at the way most QSOs are being conducted with gentlemanly manners prevailing. And in general, there seems a greater recognition of the need to keep 52.050MHz as a calling channel rather than a working frequency, and this is good. More stations are also using 10 watts, or barefoot operation when conditions are at their best, than I have ever heard for a long time and this is to be commended. I personally have found it very rare to need to use

more than 40 watts and plenty of times 10 watts is adequate.

Whatever else needs to be said about the VHF bands can now be left until next month, when I should have some reports coming in from my correspondents in other states, together with what transpires at this end from 23/12 until next copy deadline which is 21st January 1986. This should fit in nicely with the best of this summer's Es. I anticipate some tremendous openings starting on 26/12 and going through until New Year — next months report will indicate if they eventuated.

THE ROSS HULL CONTEST

Despite the huge volume of contacts, there seems little enthusiasm for giving out numbers for the Ross Hull Memorial Contest! I personally have found that from time to time I have almost had to drag numbers from people instead of the usual spontaneity.

I thought this might be so with the drastic changes to the scoring table, but if nothing else it has made operators come out and say what they think and thus a view of feelings can be ascertained. As I said prior to the start of the Contest, that having the hindsight of this year's Contest, we should start looking at what is necessary to preserve the Contest as soon as 1986 starts, instead of leaving it until almost the time for the next Contest. I have some thoughts on the matter and will air them perhaps next month, but I want to hear from others prepared to be constructive with their thoughts, and having regard for the needs of all operators, both multi-band and those using one or two bands. If you don't think the present scoring table is right, then send me what you believe IS right and setting out examples in columns, or by some means, to indicate properly what you are saying. I need the information quickly please — by the time you read this it will be February and March copy will already be in the Editor's hands, so the earliest anything can be printed for readers is April, and that is four months into the year.

EME REPORT

Doug VK3UM used the call sign VK75A for his random contacts on 2/11 and 3/11. Conditions were poor to the US and fair to Europe, the position being reversed on 3/11. Contacts made on 2/11 were: 1415UTC K1FO sent 549, received 439; 1911 DL9KR 349/449; 2001 DJ6MB 439/449; 2025 DF3RU 549/549; 2033 F9FT 4x3/4x3; 2102 OH2TI 0/0 — this was a new country so Doug also worked him as VK3UM; 2132 F1FHI 0/0.

3/11: 1500 WA1RWU 4x4/4x3 (also as VK3UM); 1540 K2JOK 4x4/3x3 (also VK3UM); 1645 VE4MA 0/439; 1800 W7GBI 449/439; 2035 SM3AKW 439/449; 2054 DL9KR 5x5/5x5; 2115 HB9SV 0/M.

As an indicator of the poor conditions, HB9SV is one of the best stations, using 16 bays of DL6WU antennas, wooden booms and open wire feeds.

On 23/11, again using VK75A: 0825 JA9BOH 0/0; 0910 JA4BLC 339/339; 1342 KB5GB 439/439 (also as VK3UM); 1405 JA6CZD 449/449; 1450 DF3RU 449/0; 1543 G3LTF 339/339; 1557 F9FT 439/439; 1607 F1FHI 0/0; 1630 I5MSH 439/439.

24/11: 0657 K2UYH 4x3/4x4; 1325 OH2DG 339/339; 1505 DJ9BV 0/0 (also VK3UM); 1530 HB9SV 439/0; 1548 G4EZN 349/M — five minutes later reports were exchanged 559/449 (also VK3UM); 1606 DJ6MB 449/449; 1615 to 1637 Doug reported "all hell was let loose" with up to three stations calling at once, so started working break-in! 1637: conditions were going down again, G3LQR 339/339; 1657 F9FT 439/439.

50-54MHz DX STANDINGS

DXCC Countries based on information received up to 15th December 1985. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given for contacts made with stations when 50MHz was not authorised.

Column 1: Six metre two-way confirmed
Column 2: Six metre two-way worked
Column 3: Crossband (6 to 10) confirmed
Column 4: Crossband (6 to 10) worked
Column 5: Countries heard on 50MHz
Column 6: Countries heard on 52MHz

Call Sign	1	2	3	4	5	6
VK8GB	39	39				
VK2BA	28	29				
VK2DDG	25	26	2	12	3	
VK3OT	25	25			10	
VK4ZJB	23	24				4
VK2QF	23	23				
VK2VC	22	22				
VK2BNN	20	21				
VK3XQ	19	20			1	1
VK5LP	18	20			6	3
VK3AMK	17	17				
VK4TL	17	17				
VK4ALM	17	17				
VK3NM	16	17				
VK7JG	16	17			2	
VK3AUI	16	17				
VK4ZSH	15	16				
VK4ZAL	14	14				
VK6OX	10	10	1	1		
VK3ZZX	10	10				
VK6RO	9	9	3	3	2	3

The minimum number of countries confirmed for an operator to commence being listed is five, including VK.

The position on the list is determined by the number of confirmed contacts. Where two or more operators have the same total, those first date listed with that total can only be displaced by someone having a greater number of confirmed contacts.

The next list is due to appear in August 1986, and entries will need to be on my desk no later than 15th July 1986. Claimants are reminded that full details of all contacts are required, viz date of contact; time in UTC; call sign of station worked; country; mode; report sent; report received; QSL sent and whether received.

Split frequency contacts should be indicated. Please add YOUR call sign and signature, plus the date of your claim.

Most of the submissions sent to me so far have been very neat and precise and are a great help in determining eligibility. Computer print-outs of claims and updates are quite acceptable. I still reserve the right to require any claimant to send me any QSL cards needed to verify a particular contact.

There are still a lot of operators around the country with good tallies who are not listed. A few who come readily to mind include VKs 1VP, 2BHO, 2KAY, 3AOS, 3AUU, 4ZAZ, 4JH, 4RO, 5RO, 5ZDR, 5DK, 6HK, 6KZ, 7ZIF, 7KJ, and 8GF. There are many others of course, but the inclusion of most of the above would make it a rather interesting list. Once the original list is made, updating is easy.

CLOSURE

There is still quite a lot of material suitable for these columns on my desk, but this will have to be carried over until next month — I cannot extend the Editor's friendship too far by continuing to use up space.

Please remember the Ross Hull Contest entries must arrive at the Contest Manager's desk by Friday, 7th February 1986. If you entered, please send in a log and add any constructive comments.

This year, South Australia celebrates its 150th Anniversary and it will be a very busy time for many people, including your scribe. I hope I can stand the strain!

Closing with the thought for the month: *"A man profits more by the sight of an idiot than by the orations of the learned"*. 73, The Voice in the Hills.

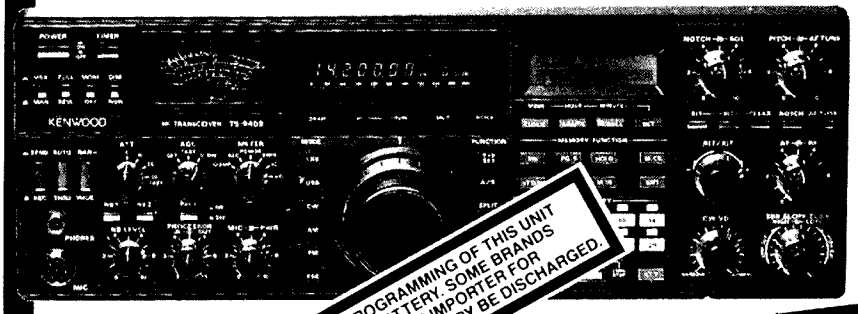
AR

Ross Hull Contest Logs must be on the FCM's Desk by 7th February 1986

KENWOOD

TOMORROW'S SOPHISTICATION FOR TODAY'S ENTHUSIAST

TS-940S



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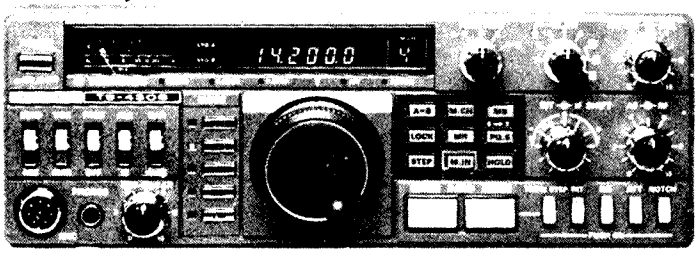

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REG STOCKMAN COMMUNICATIONS—CNR BANOCKBURN RD & SHIRLEY ST., INVERELL (067) 22 1303
ELECTRON 2000—3 ELIZABETH STREET, TIGHES HILL, NEWCASTLE (049) 69 6399
WORMALD COMMUNICATIONS—51 DENNISON STREET, HAMILTON, NEWCASTLE (049) 69 1999
MACELEC PTY. LTD—99 KENNY STREET, WOLLONGONG (042) 29 1455
E&K COMMUNICATIONS—14 OUTTON STREET, DICKSON, A.C.T. (062) 49 6437
DX ENGINEERING—5 JASMINE STREET, PORT MACQUARIE (065) 82 0175
FRANK BOUNDY—LISMORE (066) 86 2145

INTERSTATE
VIC: EASTERN COMMUNICATIONS—168 ELGAR ROAD, BOX HILL (03) 288 3107
PARAMETERS PTY. LTD—1064 CENTRE ROAD, SOUTH OAKLEY (03) 575 0222
AM-COMM ELECTRONICS—69 CANTERBURY ROAD, EAST CAMBERWELL (03) 836 7634
BRIAN STARES—11 MALMSBURY STREET, BALLARAT (053) 39 2808
SUMNER ELECTRONICS—78 KING STREET, BENDIGO (054) 43 1977
TAS: HOBBY ELECTRONICS—477 NELSON ROAD, MT. NELSON (002) 23 6751
WATSONS WIRELESS—72 BRISBANE STREET, HOBART (002) 34 4303
ADVANCED ELECTRONICS—5A THE QUADRANT, LAUNCESTON (003) 31 7075
MARINE & COMMUNICATION—19 CHARLES STREET, LAUNCESTON (003) 31 2711
V.K. ELECTRONICS—214 MOUNT STREET, BURNIE (004) 31 7733
QLD: MITCHELL RADIO CO—59 ALBION ROAD, ALBION (07) 57 6830
S.A. &
NT: INTERNATIONAL COMMUNICATIONS SYSTEMS PTY. LTD—8 NILE ST., PORT ADELAIDE (08) 47 3688
W.A.: ARENA COMMUNICATIONS SERVICES—642 ALBANY HWY., EAST VICTORIA PARK (09) 361 5422
TRI-SALES—CNR NEWCASTLE & CHARLES STREET, PERTH (09) 328 4160
WILLIS ELECTRONICS—165 ALBANY HIGHWAY, VICTORIA PARK (09) 470 1118
BAY RADIO—22 GRACE STREET, FERNDALE (09) 451 3561
FORD ELECTRONICS—209 HANCOCK STREET, DOUBLE VIEW (09) 446 4745

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton. SA. 5014

This is the first time I have written this, or indeed any other column. I bring to it little of expertise and long experience of my predecessors, though I hope to be able, from time to time, to call on one of them for advice. My comparatively brief amateur activity has fallen into well-separated periods — as a SWL in England in 1946-56, and as VK5AKH from 1981.

I hope to continue the work of Bill Hempel in getting the DXCC records into a standard form. An up-to-date DXCC ladder will be produced as soon as possible, but I make no promise as to how soon. DXCC updating, and the ladder, will be the first priority.

The opinion has been expressed that we should forget all about deleted countries. There are things to be said on both sides. An so, in the interest of those who will never be able to work the deleted countries, the order on the ladder will be determined solely by current countries; but in the interest of those who have worked them, the score including deleted countries will appear along-side, and determine the order of those who are on the same rung.

UPDATED LISTING

The following awards have been issued since the last list was published.

WORKED ALL VK CALL AREAS

1332	*JA1BIN*	*Takashi Yamamoto*
1333	*JA4NHG*	*Masaaki Shimoki*
1334	*JA2BAY*	*Hideki Takeuchi*
1335	*JH8ABO*	*Hidekatsu Hizume*
1336	*JM1VRW*	*Toshi Takahashi*
1337	*JA2THS*	*Yoji Masuda*
1338	*OK1VK*	*Bohuslav Petr*
1339	*OK2PEX*	*Antonin Pokorny*
1400	*YV1DPS*	*Rafael Gutierrez*
1401	*G3CCZ*	*E L Devereux*
1402	*G4RZQ*	*Keith Russell*
1403	*Z24JS*	*T G Main-Baillie*
1404	*5Z4EG*	*Tony Higby*
1405	*JA8CLN*	*Hiroshi Sato*
1406	*HL2SF*	*Wonki Oh*
1407	*JF6BYA*	*Satoshi Irie*
1408	*VK2CKW*	*Ken Watson*
1409	*OK2BGR*	*Slavomir Nouak*
1410	*G4CJY*	*Brian Payne*
1411	*VK4AIX*	*Joe Ackerman*
1412	*DL1BS*	*Kuno Huber*
1413	*DJ3AS*	*Harald Doelle*
1414	*G3DZS*	*Harold Fudge*
1415	*JR1BMU*	*Akihiro Aoki*
1416	*JA0TMF*	*Hidekazu Okada*
1417	*JA5JTE*	*Hiroyuki Kurobuchi*
1418	*JH1QYT*	*Akira Numazaki*
1419	*JH1BSE*	*Masao Yamamura*
1420	*JA7LMZ*	*Fumihiro Konno*

This column will, I hope, contain reviews of awards which are both easy and difficult, those with no charge and those which are expensive. If there is any preference, it will be for awards issued in this country. To maintain this variety, club secretaries are asked to send details of their awards, and anyone at all invited to request publicity for his favourite award or specialty.

How many, I wonder have obtained the UN-DU Award, which Bill Verrall featured in this column in February 1982? It looks very colourful, and impressive on the wall of his shack. Please write to me if you have got it, and I will compile a list of holders of this award, for this column in the June magazine. If this idea proves popular, we could do the same thing with other prestigious awards.

THE LAND OF THE BEARDIES AWARD

Finally, here is a new one, which is from the Glen Innes and District Amateur Radio Club. A letter from the club relates that *the major credit for opening up the area of the Northern Tablelands, that includes Glen Innes, goes to two stockmen, Chandler and Duval, who worked cattle in the Armidale area in the 1830s. They both wore long flowing beards, and anyone looking for good land was told to look for the 'two beardies'. Hence the area soon became known as "The Land of the Beardies".*

This explains the title — THE LAND OF THE BEARDIES AWARD, which was launched at the Annual LotB Bush Festival, in November 1985.

Qualifications for the award are: 10 points which are accumulated by working club members and the club station. Point values are:

The Club Station, VK2DOQ is worth two points.

Bearded members are worth two points. These are — VK2s BGQ; BYV; EBU; ESL; and VRB.

Other club members are worth one point. These are — VK2s CDB; TB; BIO; PLN; BSF; PVD; WP; EIJ; PXT; KDA; EEX; ERS; CEC; EJW; ATS; and KFV.

One contact, per member per band, can be counted. Repeater contacts do not count. The cost of the award is $2 surface mail — air mail is extra.

Bearded claimants may have their awards suitably endorsed by sending a photograph. Claim is by certified log extract, verified by one other licensed amateur and should be sent to the Award Manager, PO Box 26, Glen Innes, NSW. 2370.

ARRL INTERNATIONAL HUMANITARIAN AWARD

The ARRL Board of Directors have established this award to recognise those licensed radio amateurs (or groups of radio amateurs) world-wide, who by use of their skills in amateur radio have provided extraordinary service for the benefit of others in times of crisis or disaster.

The Award will consist of a plaque or medallion to be presented to the recipient and an article describing the recipient's extraordinary achievements will appear in QST magazine, IARU societies' publications and general-interest consumer magazines.

Licensed radio amateurs or groups of amateurs from any country world-wide are eligible for this award, and nominations for it will be accepted from any licensed radio amateur or governmental organisation that has received the benefits of a radio amateur's extraordinary service. Nominations must contain

. . a summary of the actions of the nominee that qualify him/her for the award; and

. . statements from at least two references including names and addresses (and telephone numbers where possible) for verification.

All nominations must be sent to: ARRL International Humanitarian Award, American Radio Relay League, 225 Main Street, Newington, CT 06111, USA.

In the event that no nominations are received, the ARRL International Humanitarian Award Committee may itself determine possible recipients. The Committee reserves the right to make no award in a given year.

Nominations and supporting material for the 1985 Award must arrive at the ARRL Headquarters prior to 1st May 1986 and the recipient will be announced in July 1986.

Nominations for the 1986 Award and subsequent awards will close on the last day of the year, 31st December.

All radio amateurs are also invited to submit designs for the plaque or medallion that will symbolise the ARRL International Humanitarian Award.

Designs will be judged on aesthetics and how well they symbolically represent both international understanding and goodwill, and assisting people in need through amateur radio. Each design must include the ARRL diamond logo and the "ARRL International Humanitarian Award" title; each must be submitted on a separate piece of 8½ x 11-inch white paper. The name, address and call sign of the artist must not appear on the front of the paper but must appear on the back of each entry. Artists may submit as many entries as they wish. The recommended dimensions and other production specifications must be clearly stated for each submission.

The artist whose design is chosen will be awarded an engraved plaque, a clothbound 1986 ARRL Handbook and photo coverage in QST magazine.

Entries should be addressed to "Humanitarian Award Design Contest", postal address as above, and must arrive no later than 16th June 1986. All entries become the property of ARRL and cannot be returned.

VK5 JUBILEE 150 NETS

South Australian radio amateurs will be active in 1986 for the celebration of the State's 150th Jubilee year.

Nets will be in operation to promote the Jubilee 150 to DX and interstate stations and facilitate exchange of points for the Jubilee 150 Award.

Full details of the Award were published in AR October, page 47.

PHONE NETS (all times UTC, frequencies MHz)

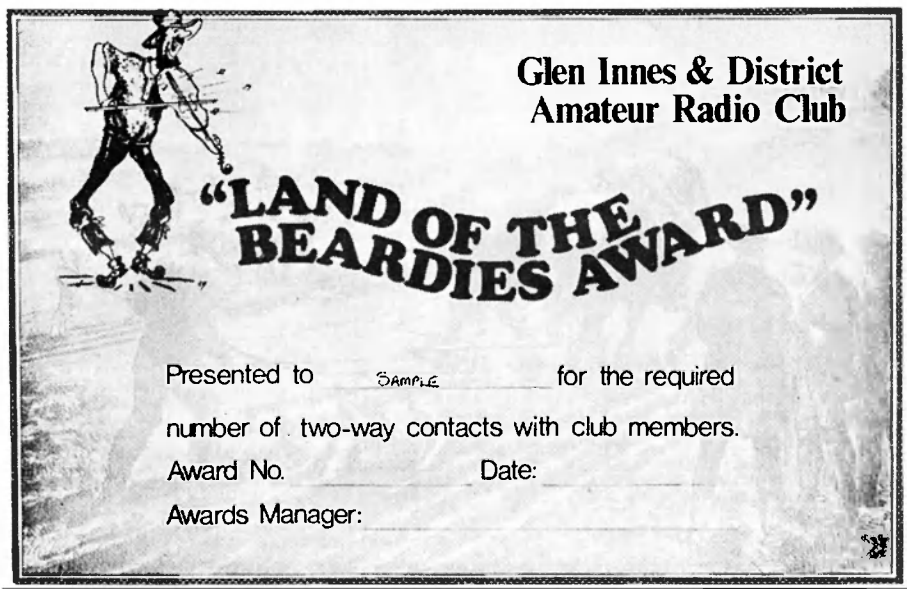
Primary net —

Sundays, Tuesdays, Fridays, on 3.586 at 1000.

Other nets —

Monday, on 7.086 at 0100; 14.186 at 0200; 28.470 at 0900.

Tuesday, on 14.186 at 1000; 21.186 at 0400; 21.286 at 0600; 14.286 at 1100.



Wednesday, 21.186 at 1000; 28.470 at 2230.
Thursday, 7.086 at 0300; 14.186 at 0300.
Friday, 14.286 at 1100.

The Primary Net on 3.586MHz will remain throughout 1986. However, other bands and time will change according to conditions. These changes will be publicised one month prior to coming into operation.

CW NETS

Primary net —
Monday, Thursday on 3.536 at 1000.

Other nets —
Tuesday, 7.036 at 0100; 21.136 at 0900.
Wednesday, 14.036 at 0300; 3.536 at 1000.
Thursday, 7.036 at 0300; 21.136 at 0500.
Friday, 14.036 at 0900; 28.186 at 0300.

DX operators are requested to operate on, or near the above frequencies at other times as these frequencies will be widely published via Nets and Clubs, etc.

VK5 stations will check in during the 10 minutes prior to the nominated starting time to allow easy listening of other stations wishing to contact VK5s.

AR

PRINTED CIRCUIT BOARDS
(VHF COMMS MAGAZINE)

Eycke Zimmermann ZL1AGQ, is the local (ZL) facility for the manufacture of printed circuit boards for the VHF COMMS Magazine. Eycke holds the negatives, and he can be contacted at:

PO Box 31-261,
Auckland 9
New Zealand

Amateur Radio MAGAZINE AWARDS

Marlene VK5QQ

Ron VK5AFW

Lloyd VK5BR

At the December Publications Meeting, the Annual Amateur Radio Awards for 1985 were selected. The Award recipients are:

Marlene Austin VK5QQ, was awarded the Alan Shawsmith Journalistic Award for her article on the history of the VK5 Division.

Ron Cook VK3AFW received the Higginbotham Award for his services and articles to Amateur Radio.

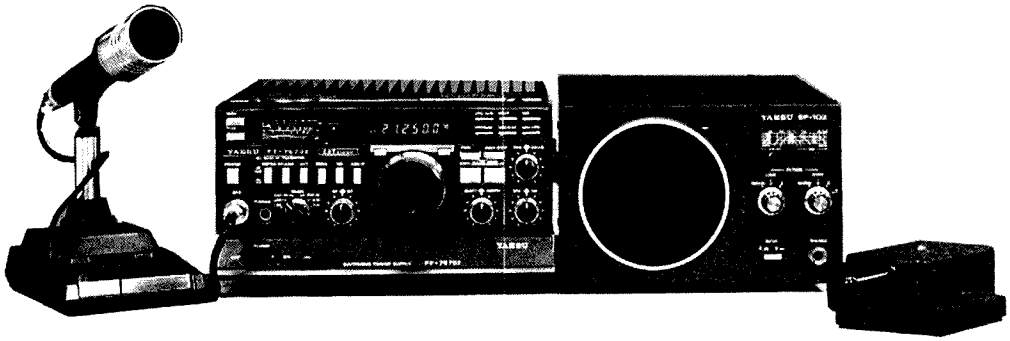
Lloyd Butler VK5BR, was awarded the Technical Award for his various articles contributed to Amateur Radio during 1985.

The Committee considered that the Initial Aircraft Enhancement article, written by Doug McArthur VK3UM, was worthy of an Honourable Mention.

BAIL ELECTRONICS

asks you to look at our range of

AMATEUR GEAR



HF TRANSCEIVERS

FT980-all mode; 12 memories; general coverage receiver
FT757GX-all mode; 8 memories; all normal options installed; general coverage receiver

VHF & UHF TRANSCEIVERS

FT726R-all mode; 10 memories; 10 watts output; two VFOs; can hold three modules (2m, 6m, 70cm, 21/28m modules) plus satellite IF unit; AC/DC operation

FT203R-handheld 2 metres; 2.5 watts, thumbwheel; optional headset/microphone & VOX operation
FT209-RH-handheld 2 metres; 5 watts; keypad entry; optional headset/microphone & VOX
FT290R-all mode portable 2 metres; 2.5 watts
FT270R-mobile 2 metre FM; 25 watts; 10 memories; optional voice synthesiser
FT2700R-mobile 2 metre & 70cm; 25 watts both bands; 10 memories; full duplex 2m/70cm

FT703R-70cm handheld; thumbwheel 2.5 watts
FT709R-handheld 70cm; keypad entry; 45 watts

LINEAR AMPLIFIERS

FL2100Z-160 — 10 metres; 1200 watts maximum input
FL2010-2 metres; 10 watts out; suits FT208, FT290, etc.
FL7010-70cm; 10 watts out; suits FT708, FT790, etc.

ANTENNA TUNING UNITS

FC700-suits FT707/77; inbuilt 150 watts dummy load
FC757AT-automatic; suits FT757/FT980; inbuilt 150 watts dummy load
FAS-1-4R antenna selector (four-way)

EXTERNAL VFO

FV700DM-suits FT77/707; 12 memories
FV102DM-for FT102

TRANSVERTER

FTV707-suits FT707/77, takes one module
-6m, 2m, 70cm modules for FTV901, FTV107 & FTV700

POWER SUPPLIES

FP700-suits FT77, FT757; 20 amp inbuilt speaker
FP575GX-switch mode; 20 amps
FP757HD-heavy duty; inbuilt speaker fan
FP7-3 amps
FNB-2, FNB3, FNB4-NiCad packs for handhelds

CHARGERS AND DC/DC ADAPTERS

NC-15; NC-8; NC-3A; PA-2; PA-3; etc.

EXTERNAL SPEAKERS

SP102-suits FT102, FT726, FT757GX; has filters
SP980-suits FT980; has filters
SP55-general purpose

TRANSCEIVER ACCESSORIES

AM/FM units; keyer units; WARC bands mod kit for FT101Z, FT107, FT901; FIF-232C (RS232 interface); extender boards; mobile brackets; etc

MICROPHONES

MD-1B8-deluxe desk type with scanning
MH-1B8-hand mic with scanning
MH-12A2B-speaker/mic for FT203, 209, 703, 709
MF-A3B-boom mic for mobile or base use
YM-34-desk mic; dual impedance
YE-7A-hand mic; 4 pin; 600 ohm

We also have a range of YAESU COMMERCIAL HANDHELDS and MOBILES approved by DOC. Low and High band VHF, VHF Marine handhelds, UHF handhelds and mobiles.

TELEPHONE, TELEX OR WRITE TO BAIL ELECTRONICS FOR HELPFUL ADVICE. MAIL ORDERS ARE WELCOME.

YD-846 — hand microphone; 50 kohm.
YM-36 — hand microphone; noise cancelling.
YM-40 — for FT-480, 680, 780.
YM-47 — for FT-290, 690, 790, 230, 730.
YM-49 — speaker/mic for FT-290, 690, 790.
YM-24A — speaker/mic for hand-helds; four pin, six pin, seven and eight pin- plus and sockets for above.
YH-1 — head-set/boom microphone for hand-helds and mobiles.
YH-2 — head-set/boom microphone for FT-203, 209, 703, 709, SB-1, SB-2, SB-3, SB-10 switches.

HEADPHONES

YH-55 — with ear-muffs.
YH-77 — lightweight.

RECEIVERS

FRG-8800 — HF communications receiver, all mode.
FRV-8800 — VHF converter (118-174MHz) for FRG-8800.
FRG-9600 — VHF/UHF receiver; all mode; 60-905MHz; 100 memories.
FRT-7700 — antenna tuner for FRG7700/8800.
FRA-7700 — active antenna for FRG-7700/8800.
FRV-7700 — VHF converters for FRG-7700.
Memory unit option for FRG-7700.

HAM CLOCK

Yaesu QTR-24D — quartz, shows time zones.

FILTERS

CW, CW (narrow), AM, SSB (narrow), for transceivers.
FF-501DX (30MHz LP).

SERVICE MANUALS

For transceivers ands receivers.

VACUUM TUBES

6JS6C (NEC); 6146B; 6KD6; 6JM6; 6GK6; 12BY7-A.

SEMI-CONDUCTORS & SPARE PARTS

We have a large range of Yaesu spares; if they are not in stock, we will get them from Yaesu.

EMOTATORS ROTATORS

502SAX; 1102MXX; 1102MSAX; 1103MXX; 1103MSAX.
Rotator accessories — 301 bearings; bottom clamps; couplings; six and seven core control cable.

MORSE KEYS

Hand keys; "Bug" keys; manipulators; Katsumi electronic keyers.

METERS

SWR-200 Oscarblock power/SWR dual meter — up to 150MHz.
T-435M fwd/ref power dual meter — 146 and 435MHz 'N' connectors.
FSI-5 — SWR dual meters; ideal for low power transceivers.
YS-60 — SWR & Power; 1.6-60MHz.

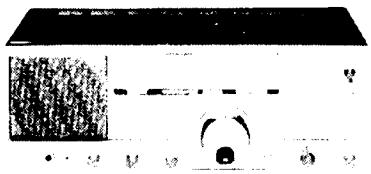
ANTENNAS

Hidaka VS-33 tri-band beam; VS-73SR UHF 7.8dB mobile; VS-73GH 70cm ground plane; VS-27GR 144/435MHz mobile.
Yaesu RSL series for HF mobiles; RSL-145 2m five-eighth wave mobile; RSL-145 2m ground plane; RSL-435 70cm colinear; spare antennas for FT-290/690; YHA-44D half-wave antenna for 70cm hand-helds.
DP-CP5 — trapped vertical 80-10m; trap radials included.

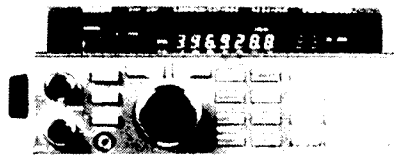
COAXIAL CABLE

5D-FB; 8D-FB; RG58U.

FT-757GX HF ALL MODE TRANSCEIVER

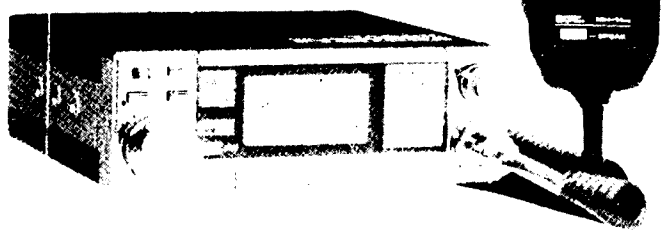


FRG-8800 COMMUNICATIONS RECEIVER



FRG-9600 VHF/UHF COMMUNICATIONS RECEIVER 60-905MHz; AM; SSB; FM; FM(W) Modes; 100 Memories; Selectable Scanning Steps.

FT-2700RH 2m/70cm DUO BAND FM 25W



How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

Ladies and gentlemen — is it not time we thought a little in to the future? Where if any, are our new exponents of the hobby being sought? I admit that we are at, or close to, the bottom of the Solar Cycle and the bands are pretty quiet but will they be as quiet when conditions improve. Many have lost interest, sold their equipment and gained an interest in another hobby, even though there are plenty of countries still to be heard.

Will they return? If they don't who will fill the void? DX operators are a 'breed' alone and we must introduce the teenagers now to this remarkable hobby that we have the privilege of using.

How many DXers have assisted in introducing it into the schools, JOTA and Youth Organisations? I feel that it can be answered with saying a very small percentage of our licensees, unfortunately. As has been said in this and other columns of this magazine, 'if we do not use them, we will lose them'. The intruders are moving in and if the DXer does not expand his or her activities, they will stay.

Interest your local school, and council (who generally control youth activities in their area) now of the benefits of our hobby and please do not use the excuse that the bands will be overcrowded at the peak of the next solar maxima, as that excuse does not gell in my book, the more the merrier is the unselfish approach and let us do something about it now — before it is too late. Now is the time to recruit more members to our fraternity, whether it be on CW or SSB. Who cares, it is a hobby that is only as expensive as you want to make it.

Later this year, a technical article will be reproduced in Amateur Radio showing how to build a solid state transmitter with readily obtainable parts at a moderate cost to the individual. This is the basis for the beginner to start with and develop his or her confidence. *What do you, the reader think?* Let your division know your ideas now, so they can be discussed and a plan of action can be drawn up at the next Federal Convention.

MORE KW FOR HV

The new Ambassador to HV-land is William Albert Wilson K6ARO/I0WW, a gentleman with a very interesting history. William was born in Los Angeles on 2nd November 1914, and during his early career worked as an Oil Well Manager, then became a land developer and Southern Californian rancher. This talented man for many years was a trustee of the now President, Mr Ronald Reagan's personal finances until he was appointed the Presidents Envoy to the Holy See in 1981.

William on 10th January 1984, was elevated to the appointment of the American Ambassador to the Vatican, one of 106 ambassadors from different countries. He, with his wife, lives in a villa leased from the American University in Rome, which is located in the Seven Hills area.

William reports that the Vatican has increased power in their installations of the stations with the calls HV1SJ, HV1CN and HV2VO. It is interesting to note that HV1SJ is outside the confines of Vatican City, yet it is classed as a country for HV accreditation.

HV1CN located in the Vatican City, now sports a new set of equipment, donated by the Knights of Columbus. The equipment consists of a 930S driving a Henry 3k Linear and a five element KLM beam. Not bad if propagation is in the right, if any direction.

HV3SJ, generally referred to as 'Strawberry Jam', is running modern equipment and is under the control of 'Pino', alias Dr Giuseppe d'Aurelio I0DID and Father Lars Roth, a Jesuit Priest.

At the Vatican Observatory, the station HV2VO is operated by Father Edmundo, also a Jesuit priest whose station boasts a 930S and a Henry 2k Linear, which was donated by the Bel Air Radio Association, in Southern California.

NEW COUNTRY CRITERIA

The ARRL News Release, 6th December 1985, advises that the ARRL Awards Committee, acting on a recommendation of the DX Advisory Committee, has unanimously accepted a modification of the wording of Countries List Criteria 5(b). It now reads as follows:

5(b). The following will not be eligible for consideration as a separate entity from the host country; Embassies, consulates and extra territorial legal entities of all nature, including but not limited to, monuments, offices of the United Nations agencies or related organisations, other inter-governmental organisations or diplomatic missions.

So folks, my personal opinion is that it says goodbye to 4U1VIC and maybe TP2I, but really, *who knows?* The scene could change later this year, so keep those precious cards, just in case!

LEFT FOR PASTURES GREEN? ?

Mike A71AD, who has also operated as A7XD, for the past six years with about 52 000 QSOs under his belt, has left the State of Qatar. Unfortunately Mike had to leave the logs with the authorities and there is no chance of receiving a card if you missed out, though Mike was very thorough with his QSLing and I am sure most people would have one via the Bureau.

AZORES — A NEW PREFIX

Effective this year, the CT2 prefix, according to LES NOUVELLES DX, will be replaced by a CU plus number which will denote the licensees island of residence.

The numbering system will be as follows: CU1 Santa Maria, CU2 Sao Miguel, CU3 Terceira, CU4 Gracioisa, CU5 Sao Jorge, CU6 Pico, CU7 Faial, CU8 Flores and CU9 Corvo. Another prefix hunters delight!

A NEW DXCC COUNTRY? ?

Eventually and probably yes. I can really hear the 'mutterings' of DXers far and wide of 'not another one' as I write this! Aruba, in the Netherlands Antilles will be granted separate status this year. As from the 1st January, they issued their own stamps and will exclusively use the P4 prefix. It is anticipated that it will be a decade before full independence is granted, so rest easy folks — it may be a long way off yet and there will be many more 'new' ones to chase first.

LIFE NOT SO EASY

Larry N7DF, initially during the first weeks of his stay in Chad had to use the call N7DF/TT8, which was good for the Issuance of the permit on 12th July 1985, until 11th of October last year. Larry was using a ¼ wave 20 metre vertical attached to the balcony rail of his unit. Propagation was not good and he worked mainly Europeans and a few JAs, lots of really rare African prefixes and less than what one could count on their fingers back into his home country. Most of the operation was on CW.

Larry's problems were compounded by a six day working week of between 12 to 14 hours per day. The Ministry of Information together with the Ministry for Security, who issued his amateur permit also allowed Larry the 178th permit to take photographs. Even then he was arrested twice and of course freed on presentation of his authority after it was verified. For company he had a machine gun bunker about 15 metres away from his QTH window. Let us not complain folks, at some of our misfortunes and it can be Imagined there were no complaints about loud noises emanating from his radio, I am sure!

NEW FORMAT

World Radio has changed its format to approximately the same size as Amateur Radio. In a friendly Christmas note to the Managing Editor, Christine Wilson KA6TAL, who readers gained a profile of in the December issue of this column last year, the remark was made that it was a lot easier to read whilst having breakfast, as I pick my mail up each morning before 8am. All the contents have been retained and a couple added, including a new Editor, Lou Ann Mercer Keogh KB6HP This excellent publication, is in my opinion value for money. Good luck in the new position Lou Ann!

World Radio, like our own publication, is dependent on the amateurs and readers contributions, whether it be technical or social. *Have you contributed to AMATEUR RADIO lately?*

TROMELIN ISLAND

Roland FR7AI, hopes to activate this wanted one this month. Watch out for the 'pile ups' if the band is open and that is the big question.

PERSISTENCE

Mike VK6HD, a keen exponent of the 160 metre band, notched up his 1000th European contact on this wavelength in October. Congratulations Mike and you must have seen many beautiful sunrises.

Whilst on the low bands, one well known personality on 160m is Peter ZL9AA, who is an avid 160 metre enthusiast.

Peter ZL9AA, operating the 720A on battery power into an inverted 'Vee' antenna, from Campbell Island.

YI1BGD

This station at the present has no QSL cards of their own to issue, therefore it is estimated that there are some 2000 stacked in a cardboard box awaiting reply. The Japanese DX Family Foundation has had printed and sent to Baghdad, some very colourful cards depicting the operating position, antennas and the city Mosque.

The few operators that have individual Post Office boxes are responsible for their own cards and it is unknown if they can oblige due to economics. Yasu JR1AIB, gained all this information when he visited Majid, the Chief Station Officer. Yasu was allowed to make 20 odd QSOs on 20 metre CW, amongst whom were two JAs who received a new DX Country, to add to their totals.

Majid advises that it is best to send cards air mail, due to the hostilities by sending 'sea mail' through the Straits of Hormuz, where they could end up in the desert. He also advises that IRCs are valueless in that country if the issuing date is in excess of two years and three IRCs are required.

Yasu reports that the station is well equipped with Drake 'C' Line and an Atlas transceiver, a Tribander and inverted 'Vees' for the lower bands.

The correct mailing address for YI1BGD is PO Box 5864, Baghdad where you may have a chance of picking up that much sought after card. Good luck!

Yasu JR1AIB pictured whilst at the station.

TAIWAN

Tim BV2A/B, is still the number one amateur in this country and has moved to a new 'shack', so it is anticipated that he will become quite active again.

Tim BV2A in his new operating position.

Feng BV2DA, has worked 4 000 odd stations since obtaining his licence and his son has just returned laden with more equipment such as a triband beam, rotator and CW filter from JA. Hence a bigger signal and more time on the bands, much to Feng's wife's dismay as her complaint now is that he forgets about meals and going to church on Sunday. My advice to her is that things will get worse before they get better and it may be a case of joining the growing group of amateurs in that country and allow Feng to cook the meals.

BEWARE — ANOTHER PIRATE

Two reports of a pirate named Jason. This person is using the calls of BV0BA, CR, JC, JR, RL, CRA and BV9CR. It appears he is working lots of JA, VK, W and ZL amateurs.

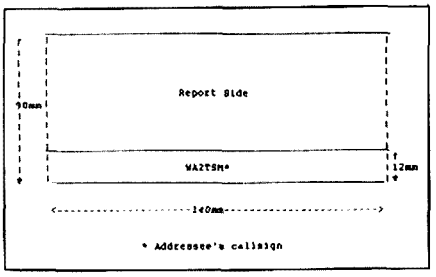
At the time of writing the only authorised call signs issued are BVs 2A, B, DA, FA (one of the amateurs who supplied the information), GA, 5HA, 6IA, 7JA, LA, ZA and the special station BV0CRA, which is not presently in use. The legitimate users of the frequencies in Tiawan are very upset about the embarrassment this 'person' is causing them. Let us as DXers assist them, by ignoring the 'pirate calls'.

QSL CARDS

I started something when I commenced mentioning QSL cards. Ash VK3CIT/ZL4HM has written to express his concern about computer generated cards and recalls reading somewhere of a complaint by a bureau that they did not have enough stiffness in them and QSLs printed on computer paper were not convenient to handle.

Practical Wireless quoted a Region 1 decision that was apparently approved by the other two regions. The specifications are as follows: *Dimensions 140mm x 90mm and a paper weight of between 190-250gsm. The report side of the card must have a 12mm high strip at the bottom and must contain only the recipient's call. This will assist future optical scanning of cards for rapid processing. Computer generated cards on plain paper are not acceptable.*

According to the QSL Card Working Groups Report at the Sixth Regional Conference held in Auckland last November, it was recommended that an interim specification similar to the above be adopted for societies to base their own specifications and the JARL be asked to continue liaison with societies in other Regions with



The card as Ash recorded it in his computer.

reference to automatic handling and machine sorting techniques.

I must clarify my own computer generation of cards. The information (sorted alphabetically by call sign) is printed onto a standard adhesive label which is attached to the card. No sorting is then required.

MINAMI TORISHIMA

This small triangular Island, with each side measuring about two kilometres, has a 1500 metre runway and a 400 metre LORAN tower, and a population of only a handful of inhabitants who are employed by the Department of Meteorology and the Defence Department. Special permits, not easily obtainable are required to visit the area.

Masa JH5EES, visits the island about once a month and of course operates his equipment as time permits, which is capable for all bands on both CW and SSB. If you want this island, drop Masa a line with an SAE plus two IRCs and set up a sched. He is very obliging and I am sure it will bring results.

THE 'GLOBETROTTING COLVINS'

Heather VK2HD, has kindly passed a letter on from Lloyd and Iris Colvin via the YASME Foundation. Iris and Lloyd note that they made approximately 10 000 QSOs from Namibia in South West Africa to amateurs in 146 countries.

They note that they were one of the first to use the ZS3/home call and Iris's call was in use this time. There was much confusion by the amateurs calling ZS3/W6QL, with calls being heard such as W6QL/ZS3, ZS3/W6, ZS3, W6QL, ZS3QL and on it went.

If you worked such strange calls, you were not the only one and please check your log and submit the correct call when applying for your card to PO Box 2025, Castro Valley, California 94546 USA.

They both hoped to be operating from the Kingdom of Lesotho prior to Christmas last year.

THE COLVIN CERTIFICATE

In the November issue, I expressed an opinion about a 'Colvin Certificate'. In fact one does exist. Reg VK3YD, has provided proof of that by supplying Certificate No 344.

Perhaps the Yasme Foundation would like to supply details and they will be promulgated in this column to the folk that have worked the family over the years and been unaware of its existence. Reg's certificate for CW operation is by no means the first and that was issued on 1st June 1969.

BEWARE! !

Some person is pirating the call 9M2PV and quoting VK2KF as the QSL Manager. This is not a genuine operation and any clues as to who the culprit could be would be appreciated by the Malayasian authorities and VK2KF

ANOTHER OTH RADAR SYSTEM

It appears that the JA defence forces will be setting up a system during this year. It is proposed to mount the 200kW transmitter on Iwo Island, which will take up an area of 375 metres by 375 metres. The receiving site is anticipated to be on Chichijima Island, which is the main island of the Ogasawara group and 50km from the transmitter and will take up an area 2750 x 120 metres. The frequency range spread over 24 channels is in the range of 5 to 28MHz. Let us trust that none of those channels fall in the amateur spectrum allocations.

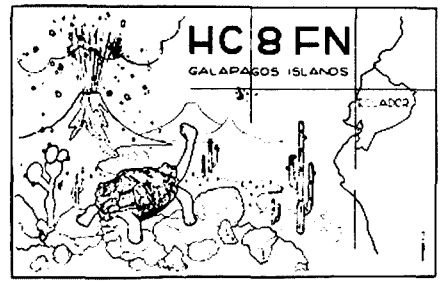
Rick NE8Z/HC1MD/HC8MD and a Galapago Turtle.

THE GALAPAGOS ISLANDS

A note from Alf VK3LC is of interest as he visited this area late last year. Alf is well-known to many for his magnificent work with Intruder Watching in this country and Region 3.

Alf notes that he was a little disappointed in the area of islands. Firstly *'they were very barren and desolate; secondly, the large tortoises were only seen in enclosures at the Darwin Research Centre, just like a zoo. Certainly the authorities are breeding from them and there are several pens in the Centre with young tortoises, but I expected from the brochures and TV documentaries seen, to see them roaming around the islands. Thirdly, the Iguanas. In the brochures etc they appear as large dragon type monsters, but they are small (45 to 60 cm in length) docile creatures'.*

Radio-wise, Alf was fortunate in meeting Forest HB8FN and enjoyed a nice chat with him. Forest has Drake twins on 14 and 21 MHz and a three element Yagi up at 20 metres. He noted that he loved the islands and they were his chosen home. Thanks Alf for your actual description of the Galapagos Islands.



Forest's Card tells its own story.

PETER 1 ISLAND

Unfortunately *Jin* JF1IST, *apparently* had to abort his plans of visiting this desolate area due to transportation problems. So the question now is who is going to be the first to actuate the area. Personal feelings are that it should be left until propagation is better and a reasonable onslaught can be made that will satisfy all continents. Unfortunately economics may dictate and probably will, when a signal can be transmitted from this barren rocky outcrop.

Jon 3Y9WT, has been worked and it appears he is on the Antarctic mainland, whether a check of the Bouvet unattended base will be made on the return trip later this month or early next month is unknown, but it may pay to watch out for a short operation. It has happened before!

ARGENTINA AREA IDENTIFICATION

The authorities in Argentina use the first letter of the suffix to denote the area the station is operational from, not the numeral. For example A, B and C denote Buenos Aires, D and E the Province of Buenos Aires and Z is reserved for the Arctic and Antarctic Regions. My comment, a strange system!

LIZ W3CDQ — AGAIN! !

A reader has kindly sent me a photocopy of a couple of pages of the 12th Edition of the Wireless

Course published in 1923. Included is a photo of Liz, taken at the Bureau of Standards. A small world that such a publication would still exist and be held by a VK amateur!

IMPOSSIBLE? IT MAY BE NOT!

CO Magazine is awarding a special certificate for the popular Worked All Zones Award to commemorate its 50th Anniversary for those working the 40 Zones between the 1st January and the 31st December, this year. Bands that may be used are 80, 40, 20, 15 and 10 metres.

A challenge ladies and gentlemen and as It is a multi-band and any or mixed award, it may not be so difficult. The difficulty will be in getting the cards, as I see it.

SMILE AWHILE

The following is adapted from QRZ DX and originated from the 'Lincoln Log', newsletter of the Lincoln (USA) Amateur Radio Club where KC0SYT came up with some humourous call signs such as: SP1NE, for a Polish chiropractor, JA1LER, a Japanese prison guard, AH0Y, a Mariannas sailor, CO1NS; an employee of a Cuban Mint, M1NK; a (former) San Marino furrier, ON1ONS; a Belgium shallot grower and PA1NS, yes you guessed it or did you? A Dutch dentist. Sincere apologies to the holders of these call signs (VK3AH).

SAVE YOUR MONEY!

Apparently Peter Moore ZM7PM and ZK3PM, is not answering mail addressed to him via PO Box 7344, Wellington South. It would be prudent to hold cards until something starts to materialise from this operation.

BITS AND PIECES

A number of new licensees operating from Jordon after the recent examinations. ** Dr Prabha Kajla VU2KJ, is the first YL in India to have passed the Advance Grade of Licence. Congratulations Prabha. ** Alain 5R8AL quite active again after his holiday in Europe. ** OH8OS has eight 6-element KLM 20metre monoband Yagis on a 55 metre high rotatable tower. Can anyone beat that? ** Diane 5L2EF runs a DX Net on Mondays at 2030UTC on 14.233 MHz. ** Watch for the South Orkney Islands, this and next month. Also VP8 South Georgia, shouldn't be overlooked in case of a possible operation. ** Willis Island is presently being activated by Graham VK9ZG, until his tour of duty ends in June this year. ** More activity is expected from Christmas Island when Dennis VK9XJ returns from holidays in Perth. ** Cards from KD7P have been despatched. ** Rudi, who was operating from Lord Howe as VK9NM/LH was flown out by the RAAF under emergency medical conditions late last year. **8P9AF and 8P9AG was a legitimate K6ZM. The authorities made an error. QSL for either call to K6ZM. ** If you worked ZF2IB/4X, don't bank on it being acceptable for DXCC or awards as it appears ZF2 is only recognised by non-residents for use in the Caymans. ** Stu, formerly H44SH, is now in the Congo and hopes to receive operating privileges. ** Don't forget Chris ZL8OY is quite active from Raoul Island in the Kermadec group. ** IQ8RAI was a special call to celebrate 60 years of broadcasting in Italy. QSL to I8WYD. ** UA1PAP is located in Franz Josef Land. QSL to UZ1OWA via the Bureau. ** Luis S92LB, is still quite active around 14.180 MHz at 2200 UTC. ** A25/G3HCT made 17 000 contacts in 26 hours of operation mainly on 21 MHz CW. Not a bad effort in anyones language. ** The ARRL DXCC Desk, under the control of Don Search, is overworked and they are at the present running five to six months behind on applications and updates. They have advertised for a helper to assist Don in his duties. ** H44IA, a keen exponent of the low bands goes QRT this month. ** Ron ZL1AMO may make it to the Tokelau Islands next month by all reports. ** Club stations in France now sport an FF prefix. ** Look for Andy HG4SEA/MM, who is aboard his homemade 9.6 metre yacht on a three year cruise which is expected to cover 60 000 nautical miles. He hopes to be in Australian waters by Easter. ** EF0NG was a special Spanish event station. The EF0 prefix is only the second issued. The first belongs to His Majesty King Juan Carlos EA0JC. ** Unfortunately a fire at the QTH of CT1AES destroyed many incoming QSL cards. If you are awaiting a card, it would be prudent to reapply. ** Loly EA9RY, Is purported to be the first YL to operate from Melilla. QSL via her OM EA9IB and Pilar EA9AM, was the first YL to operate from Ceuta. QSL via the OM, EA9IE. ** The Visalia DX Convention is being held on 18th to 20th April this year.

STATISTICS

At 30th July last year, there were 410 287 individual operators, plus 2 268 Club Stations in the USA. The most popular was the General Class, which accounted for in excess of 116 000 operators. It is interesting to note that up during the month prior to this period 2 050 upgraded with the majority going from the Novice grade to the Technician grade. 307 upgraded to the Extra Class.

CAUGHT IN ICE

The Nella Dan, with a crew of 32 and 36 expeditioners and scientists aboard was unfortunately caught up in an unusual 10km ice formation for 47 days, near Amundsen Bay, off Endeby Land, making it impossible to retrieve Colin VK0CC, and the other 13 members of the scientific team on Heard Island at the appointed time, plus other duties and throwing the complete Antarctic Division schedule due to the time available, into chaos. At the time of writing all systems are go again with the vessel having returned to Hobart after having been assisted by the Japanese 17 200 tonne 'ice-breaker' SHIRASE and guided to safety.

The scientists aboard the stranded vessel had been able to carry out research previously thought beyond their wildest dreams and the vessel and crew of the other Antarctic vessel ICEBIRD, in conjunction with the Australian Navy flagship, STALWART, that was hastily diverted from the Philippines and hired by the Antarctic Division, at at an estimated cost of A$250 000, has been doing a sterling job, even if over-worked.

QSL MANAGER

A card and note from Luis HI8LC, notes that he has been licenced since 1961 and held the position of the Manager of the free incoming QSL service since 1962. Quite a period Luis. My question is *how did you manage the time to become the first HI to gain Five Band DXCC, have 310 countries confirmed?* The front of your card, noting your achievements, reads likes an Awards Manual. Congratulations Luis and what is your secret?

Luis's QTH is Luis P Caamano, PO Box 88, Santo Domingo.

DX NET LIST

Dieter OE2DYL, a QSL Manager for 21 stations, has updated his DX Net Listing and it now contains over 100 different DX Nets. Dieter is offering it, together with an up-to-date ARRL DXCC list for for 11 IRCs. If interested, inquiries should be made to Dieter Konrad OE2DYL, Bessarabierstr.39, A-5020 Salzburg, Austria.

WORKED FROM THE WEST COAST

160 METRES
4U1ITU, C53AA, FK8DK, JT0ECF.
80 METRES
DJ9ON/S9*, TA1E, VP2MW, VP2VCW.
40 METRES
DJ9ON/S9*, OH1RY/C56

WORKED FROM THE EAST COAST

20 METRES
3D2ER, 3Y9WE, 4D9RG, 5H3CE, 9J2BO, 9M8EN, 9M8GH, 9M2TR, A4XJW, A71BK, CX7BY, EI8ED, GW3NNF, OE5BA, OE5JTL, ON7IP/ST2, S79CW, SV0DN/SV9, VR6TC, VS8DO, ZK3PM, ZL7AA.

THANKS

Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-QSO, DX FAMILY FOUNDATION NEWSLETTER, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, QRZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, cqDX, JA CQ, JARL NEWS, KARL NEWS, QST, RADCOM, VERON and WORLD RADIO.

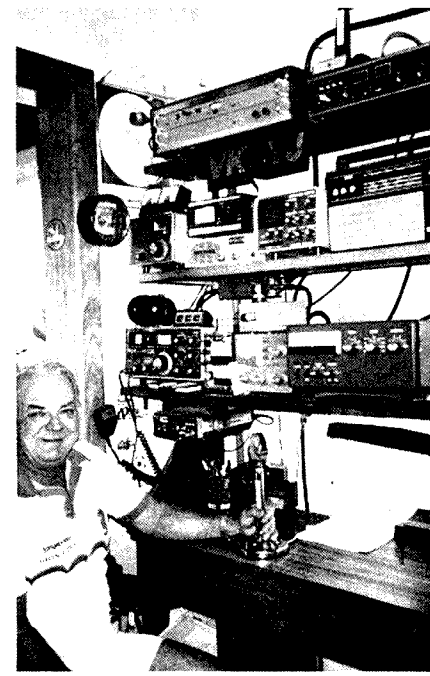
Members and individuals who have contributed include VKs 2HD, PS, ZF, ANO, COP, EBX, 3EW, FR, YJ, YL, AUI, 4EJ, AIX, VK5ZPT, 6HD, NE, G3NBC and Miss Emily Tosolini. Overseas amateurs include G1EOD, HI8LC, OE2DYL, ON7WW, WB6GFJ and ZL1AMM. Thanks to one and all who make this column possible.

HONOUR

73 For Radio Amateurs has honoured Jim VK3YJ, for his contributions to the hobby by being Australian columnist for their magazine. The magazine, to celebrate its 25th Anniversary, decided to award 25 Silver Eagle microphones made by Astatic, to individuals that had contributed to the success of the magazine over the years.

A number of observers were contacted who were au fait with the magazine since its inception and asked to nominate individuals. A list of 98 was returned, these after much deliberation, were reduced to 37 and eventually to the 25 recipients who were awarded the prestigeous presentation.

Jim, was nominated for the 73 International segment by the 'jury' from 60 amateurs who had forwarded more than 1000 columns since 1983. Quite an honour and congratulations Jim, also to your wife Anne for her typing abilities for the onerous task that you reluctantly took on for the WIA so that this countries flag would be displayed each month. It is known that it took many hours of research, writing and rewriting under, at times, extreme difficulties due to business commitments and the joys of meeting 'deadlines'. Incidentally, Jim was the only recipient outside of the United States, which speaks for itself.



Jim VK3YJ, in the 'shack', with the prized award.
Photograph courtesy Mark Joyce.

AUSTRALIA'S OTHR BECOMING OPERATIONAL

The experimental Jindalee Over-the-Horizon radar system, north of Alice Springs will be upgraded at a cost of $40 million to a fully operational system, this year.

It will be used for the defence of Australia's northern coastline and help to detect illegal immigration and drug smuggling.

The Defence Department claims Jindalee, which has been working on an experimental basis for several years, surpasses similar US and USSR radars.

Additional Jindalee units would probably be required to obtain full coverage of Australia's north and a Defence Department study has to examine this question.

NOVICE NOTES

STARTING A RADIO ELECTRONICS WORKSHOP

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

PURPOSE

There are many benefits to be had from maintaining facilities for home construction and repair of electronic equipment. The most obvious are:

. Pleasure and satisfaction derived from 'rolling your own'.
. Experience is gained in design and troubleshooting.
. Saves money.

Newcomers to the hobby should give serious consideration to setting up at least the basics of a workshop. The purpose of this article is to introduce some well-known, and perhaps some less familiar items which should prove helpful.

ACCOMMODATION

The amateur will probably not have much choice as to where he or she may install a workshop. If a choice does not exist however, places which are subject to extremes of temperature, humidity, dust, or noise should be avoided. There are also some more subtle considerations. For instance, an uninsulated metal roof will, under certain weather conditions, allow condensed water to fall from the underside. Also, unsealed concrete surfaces will emit dust and sweat moisture. A timber floor is to be preferred over concrete, as it is possible to stand for longer periods without fatigue. If carpet can be arranged, so much the better (don't fall into the habit of flicking solder onto the floor, however!).

The workbench should be about waist height, with a three or four legged stool to suit. The bench should be located near a window, preferably under it, so allowing work to be done with natural light during daytime, and will prevent a feeling of being cut-off from external activities. A raised shelf with a depth of about one third that of the bench will be found handy to accommodate the most oft used test equipment (see photo). The full area of the bench can then be used productively. An incandescent lamp on a flexible arm should be provided. Fluorescent tubes generate considerable radio-noise, so this must be kept in mind when working on sensitive equipment, such as receivers.

STORAGE

Amateurs are great hoarders. We collect 'stuff' from all sorts of sources, knowing that it will be useful — one day. There are lots of storage devices available now. Some of these, and cheaper methods are outlined below:

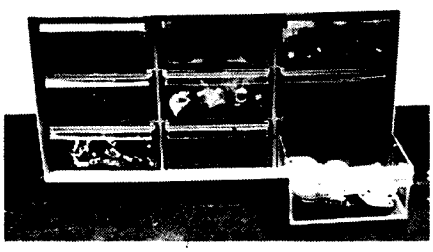


Photo 2 — Willow Storage Bin (plastic drawers).

. Willow, Capstan, and Ikea make a range of storage bins and drawers (see photos 2 and 3). Unprotected CMOS and FET devices should not be stored in plastic boxes however, due to the likelihood of damage by static electricity.
. Magazines, books, and the larger electronic parts may be stored in wine casks (see photo 4).

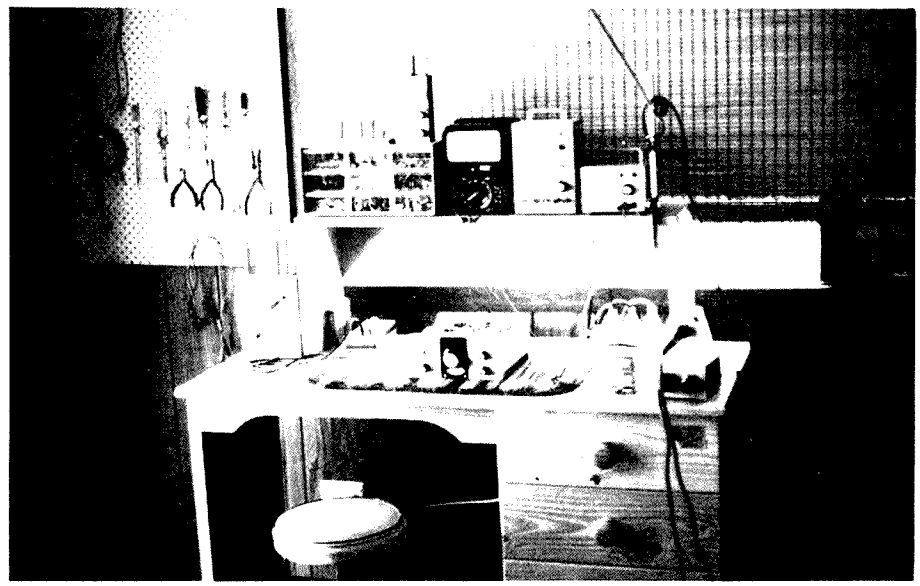


Photo 1 — Suggested Bench Layout.

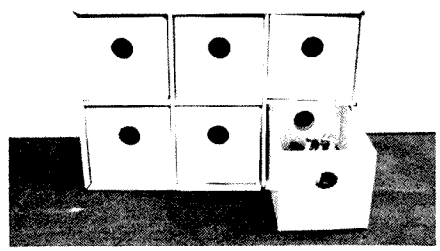


Photo 3 — Ikea Storage Bin (cardboard drawers).

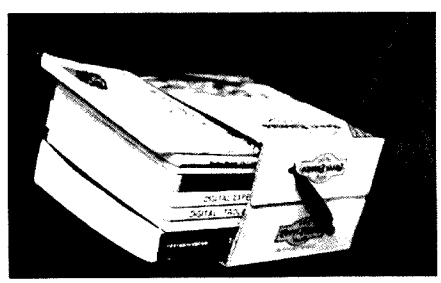


Photo 4 — Wine Cask Magazine/Book Storage.

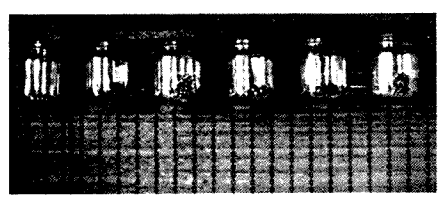


Photo 5 — Baby Food Jars.

The bag has been removed and the tap end cut out with a sharp knife.
. Components, screws, nuts, etc, may be stored in small jars. Baby food jars are ideal for this. One method is suggested in photo 5.
. A methodical filing system should be established early. Metal filing cabinets sometimes become available through disposals sources. Until a reasonably priced one can be located; a cardboard box may be employed. The local supermarket should be able to oblige. More robust boxes are also available from office equipment suppliers.
. Photo 1 also shows a handy way of storing tools upon golf tees plugged into a peg board. If mounted near the workbench, circuits may be attached for easy reference whilst working.

TOOLS

Some basic metalworking tools were mentioned in Novice Notes, December 1985. For radio electronics work, a basic kit would consist of several small screwdrivers — both plain and Phillips, long and bullnose pliers, wire cutters, and perhaps a set of nut drivers. More specialised items may be acquired later as required. For printed wiring and general soldering work; a 25W iron should prove satisfactory. A temperature controlled unit is to be preferred of course, but these are rather costly.

INSTRUMENTS

Very little serious electronics work can be done without a multimeter, so this must be number one on any list of acquisitions. A meter with voltage DC and AC, current DC and AC, and resistance (ohms down to x1) will do the job. The choice of analogue or digital must be left to the individual, as both types have their pros and cons.

An audio amplifier will be found to be very handy, particularly if an RF detector probe can be added for receiver work.

There is plenty of published data for small power supplies. One of 0 to about 20VDC at 1A should receive early consideration.

For the radio enthusiast; a dip oscillator must be just about the handiest thing going, and construction of a dipper would provide valuable experi-

ence. References 1, 2, and 3 have details. There are one or two ready-made units available, but be prepared for a shock when you hear the price.

As confidence and experience increases, an oscilloscope, frequency counter, and even a signal generator may be added to the *'five-year-plan'*.

FURTHER READING

1 Radio Handbook — Orr
2 Radio Communication Handbook — RSGB
3 Novice Notes — AR May '82
4 Radio Servicing Pocketbook — Capel
5 Radio & Electronics Laboratory Handbook — Scroggie
6 Electronics Workshop Manual & Guide — Grolle

AR

Magazine Review

Roy Hartkopf, VK3AOH
34 Toolangi Road, Alphington, Vic 3078

(G) General : (C) Constructional : (P) Practical without detailed constructional information : (T) Theoretical : (N) Of particular interest to the Novice : (X) Computer Program

SATELLITE JOURNAL ... OCTOBER 1985 — General Satellite News. Beginners Guide (G)
Q S T ... SEPTEMBER 1985 — Californian Bushfire Emergency (G). Principles of SSB (N). Loop and Dipole Comparisons (T). Frequency Modulation (T)
Q S T ... OCTOBER 1985 — 902-144MHz Converter (C). 1985 ARRL DX Contest Results
C O ... AUGUST 1985 — Special Antenna Issue. "Zero Bias" Editorial
HAM RADIO ... OCTOBER 1985 — Repairing Water Damage (G). Transmission Lines (G)
RADIO COMMUNICATION ... DECEMBER 1985 — HF Convention (G). Emitter Followers (G)
RADIO ELECTRONICS ... OCTOBER 1985 — Plywood Satellite "Dish" (C)
BREAK IN ... SEPTEMBER 1985 — RTTY Issue
WORLD RADIO ... NOVEMBER 1985 — New A4 Format. World Amateur Radio News, Contests, AMTOR, Maritime, etc
C O-TV 131 ... AUGUST 1985 — 1.3GHz Power Amplifier. 70cm Probe. 24cm Trough-line Video Combiner, etc. General ATV Information and Circuits

AR

CORDLESS PORTABLE COMPUTER

The first commercially available portable computer, with a radio modem and transceiver is now available in the USA.

Known as the EST Quest Portable, it uses a 32 kbyte lap-top NEC 8021a computer. The modem and transceiver are neatly built into the bottom of the computer in a package weighing 4.5kg.

Using one watt transceivers on 72MHz, the unit transfers data using packet technology at 2400 Baud.

Developed by the American Telephone and Telegraph Company, it will be marketed for its portability and ability to eliminate the need for extensive wiring of buildings to link computers.

HEATERS BANNED

A range of new industrial heaters which interfere with aviation communications have been banned. The heaters concerned used radiation as part of the heating process. The radiation is of a similar frequency to that used for ground-to-air communications.

The heaters could cause interference which may threatened air safety, particularly when airports are close to industrial sites.

A new standard under the Radiocommunications Act limiting the permissible level of radiation from such equipment is now in force. The industrial heaters standard is one of the first under the Act which authorises stiff penalties for use, possession or supply of sub-standard equipment.

A R Showcase

NEW 2m FM MOBILE TRANSCEIVERS

The Kenwood TM-2530A/TM-2550A/TM-2570A two metre FM mobile transceivers have been designed to satisfy the needs of the most demanding two metre operator. A wide range of innovative features have been incorporated in the basic design, including a large, new, easy-to-read LCD display, 23 multi-function memory channels for storing frequency, offset, telephone number and sub- tone (sub-tone unit optional), auto-offset, programmable priority, memory and band scans, automatic centre-stop tuning, and Hi/Lo power selection. The new "25-Series" offers 2m FM mobile transceivers in three power output versions.

Australia will only be stocking the TM-2570A, which is the 70 watt model. This will be available this month.

An optional MU-1 DCL (Digital Channel Link) unit provides a revolutionary new signalling capability, giving the operator maximum flexibility and efficiency in his normal, day-to-day contacts, or in high speed net operations. Easy-to-operate front panel controls provide the final touch, making this new 2m series easily the last word in state-of-the-art technology.

For further information about the Kenwood range of products contact Trio-Kenwood (Australia) Pty Ltd, 4E Woodcock Place, Lane Cove, NSW. 2066 or one of the Kenwood dealers listed on page 51, January AR.

AR

RADIO AMATEUR ALSO BUILDS MODELS

Roy Stephens ambitions to be a Marine Engineer were interrupted when at 15 he contracted Polio. A recovery period taking many years produced an opportunity to study electronics at RMIT which led to a career in radio and communication maintenance, as well as a Broadcast Operators Licence and the call sign VK4BRS.

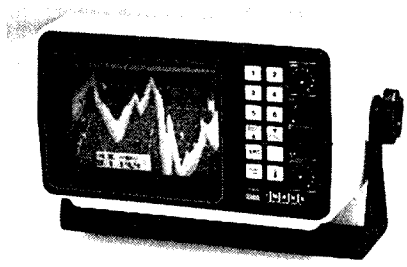
Roy, who now resides in Flaxton, Queensland, spends a busy retirement building live steam scale model locomotives which are capable of hauling 12 adults!

The photograph shows Roy using a Superscope soldering iron (which he describes as his constant companion since the early 1950s), working on an 0-6-0 (wheel configuration) tank loco. It is a freelance model of the tank locos used to haul on suburban lines before electrification.

AR

UNDERWATER VIDEO SOUNDER

The Imark DM-60 Video Sounder is for use by the serious sport-fishermen and pleasure boaters.



It is a 146 metre (480') compact, lightweight depth sounder which utilises a 15cm (6") CRT screen instead of the usual chart paper to display the sea bottom, reefs, and fish beneath the vessel. Thus, it is not necessary to buy chart paper.

The DM-60 has six basic depth ranges of 0-10, 0-20, 0-40, 0-80, and 0-160 metres. A zoom facility enables the top half or the bottom half of each screen to be displayed over the entire screen. This action immediately doubles the resolution of the display. There is also a Freeze Frame facility.

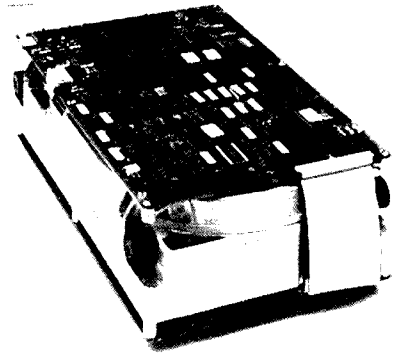
An electronic alarm facility is incorporated which provides both a shallow and a deep alarm. These settings are displayed on the CRT. The alarms can be set to sound when the depth of water becomes deeper than the deep setting and likewise with the shallow setting.

The control panel is back-lighted for night use and is easy to operate. It also includes controls to select the sweep speed, to impose a screen over the CRT display as well as gain, Shallow alarm, deep alarm, screen brightness and power ON/OFF The CRT also displays the battery voltage.

The DM-60 Video Sounder operates from a normal 12 volt battery and draws only 1.8 amps. Dimensions are 135 (H) x 205 (W) x 230 (D) mm and weighs 205kg. It comes complete with DC cable, mounting bracket, sun shade hood, operators manual, and appropriate 200kHz transducer.

Further details can be obtained from the importers, Imark Pty Ltd, 167 Roden Street, West Melbourne, Vic. 3003.

AR



NEW STORAGE OF 516 MBYTES

The Priam's 808 Advanced Series 8" voice coil technology drives are designed to provide improved data storage and management in multiuser and local area network systems.

Although packaged in an enclosure no bigger than a standard eight inch floppy drive case, the 808 Series rivals the performance characteristics of the stand alone "washing machine" storage units.

A 20 milli-second average access time and a transfer rate of 1.81 MBytes per second yield performance complementing mini and mainframe applications. Two additional bonuses of the 808 Series are the low power dissipation of 85 watts and the minimal weight of 10 kg. No special allowances for either cooling or floor load need be made.

The 808 series drives offer ESMD and Priam interfaces while lower capacity drives (227 MByte and 344 MByte) from the same series have as their options SMD, PRIAM, SCSI and ANSI interfaces.

For further information contact Priam's Australian Agent: Daneva Australia Pty Ltd, 64-66 Bay Road, Sandringham, Vic. 3191, phone (03) 598 5622 or 47 Falcon Street, Crows Nest, NSW 2065, phone (02) 957 2464.

AR

PORTABLE ANTENNAS FOR 27 AND 500MHz

Scalar Industries have designed a series of continuously loaded mobile antennas for portable and 'Walkie Talkie' applications which are ruggedly constructed to withstand rough handling. These 'stubbies' may be bent to almost any angle without cracking the protective black PVC finish and therefore cannot accidentally be shorted out.

They are for the frequency range from 27 to 500MHz. An excellent range of connectors are available including BNC; Motorola; Push-on (fits 10mm); 5/16"x 26TPI Ferrule; TNC; UHF (PL259); N types and many more.

Of particular interest are models M99RC suitable for roof mounting in mobile vehicle installations. These are supplied tuned to a specifically matched base for improved VSWR. M99RCHD with Ferrule and matched base is especially developed for ambulance use. The M99RT is for hand-held transceivers and equipment with 5/16" x 26TPI stud. Also the M99RC is normally a flexible antenna, but it can be supplied with a factory fitted internal stiffener which will convert it for heavy duty use. Always specify operating frequencies connector type and application when ordering.

For further information contact Scalar Industries Pty Ltd, 20 Shelley Avenue, Kilsyth, Vic. 3137, phone (03) 725 9677 or branch offices in Sydney (02) 502 2888; Brisbane (07) 395 1188 or (07) 395 1817; Perth (09) 446 9177.

AR

RF CONTROL YAGIS

The new Scalar 9dB UHF RF control directional Yagi antennas which are now available are six or nine element models with frequencies 450-470MHz; 470-490MHz and 490-510MHz. VSWR is 1.3:1 and nominal impedance is 50 ohms; termination is cable tail to N type female and power rating is 250 watts. These RF control links are manufactured from high grade seamless aluminium tubing and conform fully to the relevant draft specification RB 234C.

Scalar also manufacture high quality Yagis to other frequencies and gains to suit the customers particular requirement.

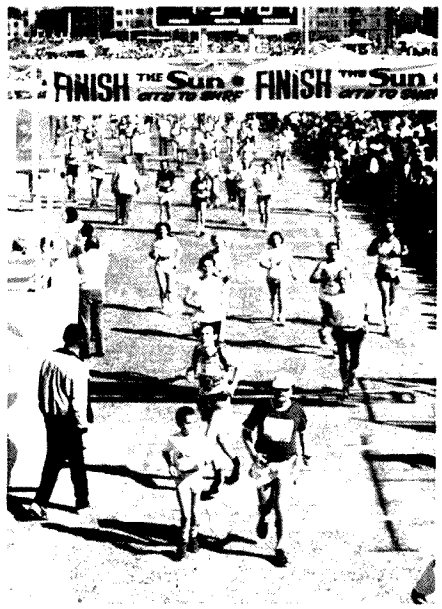
For further information contact Scalar Industries Pty Ltd, 20 Shelley Avenue, Kilsyth, Vic. 3137, phone (03) 725 9677 or branch offices Sydney (02) 502 2888; Brisbane (07) 395 1188 or (07) 395 1817; Perth (09) 446 9177.

AR

SAM DOES IT AGAIN

Sam VK2BVS, completed the 14km Fun Run from the Sydney Town Hall to Bondi Beach in 99 minutes 2 seconds. Using the call sign VI2BVS, to celebrate the 75th Anniversary of the WIA, with a two metre whip (flying the Australian flag), Sam joined 15 000 other enthusiasts in the 15th Annual City to Surf Run, held on 4th August 1985.

WICEN provides communications for this event so Sam was not short of moral encouragement and the occasional eyeball along the way.



CORRECTION CORNER

Loading up on 1.8MHz, Page 13, December 1985

Third paragraph under heading TESTS —
ItRp should read It²Rp
IaRr should read Ia²Rr

Appendix 1 —
$XI^2 = RpRa - Ra$ should read
$Xi^2 = RpRa - Ra^2$

Equation 5 should read

$$Xi + \frac{Ra^2}{Xi}$$

AUSTRALIAN CONTINENT SPANNED DIGITALLY

Installation of the world's largest digital radio trunk system has been completed by Telecom Australia and it stretches 5 100 km from Perth to Brisbane.

The 140 megabit per second system, costing $73 million, would carry large volumes of voice, data, text, sound, and television traffic with high reliability.

It can accommodate up to six radio bearers, each of which could carry the equivalent of almost 2 000 simultaneous telephone conversations or a number of television relays.

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

FEBRUARY

1- 2	*RSGB 7MHz SSB Contest (Rules January issue)*
8- 9	*QCWA CW QSO Party (Rules this issue)*
6- 9	*YL-ISSB Phone Contest (Rules this issue)*
8- 9	*YL-OM Phone Contest (Rules this issue)*
8- 9	*Dutch PACC Contest*
15-16	*1986 ARRL DX CW Contest (Rules January issue)*
21-23	*CO WW 160 metre SSB Contest (Rules January issue)*
22	*RTTY Journal Contest (Rules this issue)*
22-23	*French Phone Contest*
22-23	*RSGB 7MHz CW Contest (Rules this issue)*
22-23	*YL-OM CW Contest (Rules this issue)*
22-23	*UBA SSB Trophy Contest (Rules this issue)*

MARCH

1- 2	*ARRL DX Phone Contest (Rules January issue)*
8- 9	*QCWA Phone QSO Party (Rules this issue)*
8- 9	*Commonwealth Contest 1986 (Rules January issue)*
15-16	*Bermuda Contest*
15-16	*YL-ISSB Contest (Rules this issue)*
15-16	*John Moyle Memorial Field Day Contest (Rules this issue)*
22-24	*BARTG Spring RTTY Contest*

Preparation of material for this issue has presented me with an extremely heavy workload. My visit overseas was extended beyond what I expected and has resulted in some difficulty in even producing the results of the Remembrance Day Contest for this issue. This also means that the publication of the results of the 1985 VK Novice Contest will have to wait until March.

Comments on the RD Contest logs will also be held over.

Congratulations are due to the VK1 Division on their win in the RD. It would appear that the formula now in use for some time, to determine the winning Division, might mean that some surprises are in store in the future.

I have not had time to make a detailed analysis of the final results, although I find it interesting to note the change in situations now that the participation percentage from each Division no longer plays a part in the formula. Divisions listed in order of the result and the participation calculated by the number of logs submitted as a percentage of licensees in each Division are as follows:

VK1 — 25.7; VK4 — 2.8; VK3 — 1.8; VK6 — 8.2; VK5 — 7.7; VK2 — 1.4; VK7 — 4.5.

I am not really sure just what all this might mean, however those amongst you out there who are statistically minded might have some fun doing even more adding, subtracting and multiplying, etc.

The Field Day Contest next month is one event which I always look forward to as being one of the really fun events on the contest calendar. I find it most enjoyable getting out into the back-blocks whenever possible and stringing up antennas from whatever supports are available. It is quite surprising just how you can develop your throwing arm and the accuracy you can achieve at placing a line into one particular fork on a branch of a tree.

This year there are not many changes to the rules for the Field Day Contest. The major difference between this and last years contest is the replacement of a totally separate section for VHF operation. Some of the rules have been slightly added to so as to provide clarity of their intent, whilst some additions have been made to close certain loop-holes which have existed for some time. I would again suggest that you make yourself familiar with all aspects of the rules of any contests that you many enter. One of the changes you may note is that VHF contacts over the shorter distances do not carry the benefit of a multiplier.

As indicated in the January issue, the Federal Executive advised me that discussion regarding the CW Contest resulted in a decision to remove this from the calendar. In an effort to resolve the problems surrounding this subject, a suggestion was made by Wally VK2DEW, who is a previous Federal Contest Manager and the Alternate Federal Councillor for the VK2 Division. The suggestion to use the Federal President's Cup as a trophy to be awarded on an annual basis to the top CW scorer in the Field Day Contest is certainly a good one, and I am indebted to Wally for his continued interest and help.

You might note that in this Issue I have provided a fairly comprehensive listing in the Contest Calendar. One of my aims in doing so is not merely so that you can enter every contest that comes along, but rather that you might become just a little more informed as to just how many contests are conducted. Perhaps someone from one of the Divisions might like to take up the challenge and produce a substantial case to be presented to the next Federal Convention to the effect that there really are too many contests on our bands. I know that I don't have time to keep track of them all. I even had difficulty trying to provide some amount of help to Ken VK3AH, who is constantly making a valiant effort to produce a yearly calendar.

Time permits me no further comment this month, so you might breathe a sigh of relief at that time. Meantime, I hope to catch up on so many other matters. Completion of the 1985 Field Day Certificates, Contest Championship Trophy Results, Novice and Ross Hull Contest Results, RD Certificates to organise, as well as try to find time to do some of the necessary work around the house, and even spend a few moments on the air for myself. I certainly want to be able to find a moment to read further about the adventures of Bill Blitheringtwit and wonder whether it might, after all, be more fun to live such a carefree life in the fashion that he does.

Good luck to you in the coming events and watch out for our next main item which is the 1986 Novice Contest, to be held in June. It could be quite an interesting one this year.

REMEMBRANCE DAY CONTEST — 1985 RESULTS

The formula for the determination of results for each Division is:

Total Points/Total Divisional Licences multiplied by weighting factor.

VK1	5369/307	x	1.08	18.88
VK2	5067/4830	x	7.81	8.193
VK3	14189/6846	x	5.96	12.352
VK4	6602/2492	x	5.83	15.44
VK5	16666/1749)			
VK8	122/170)	x	1.31	11.46
VK6	12359/1394)			
VK9	519/8)	x	1.26	11.57
VK7	2871/579	x	1.27	6.297

Note: VK8 points and licence totals are added to VK5
VK9 points and license totals are added to VK6

DIVISIONAL SCORES

VK1		VK4		VK6	
HF Phone	3198	HF Phone	4801	HF Phone	4590
VHF Phone	2171	HF CW	515	HF CW	584
TOTAL	5369	VHF Phone	1286	VHF Phone	7185
		TOTAL	6602	TOTAL	12359
VK2					
HF Phone	3522	VK5		VK9	
HF CW	1496	HF Phone	12064	HF Phone	519
VHF Phone	49	HF CW	1151	TOTAL	519
TOTAL	5067	VHF Phone	3451		
		TOTAL	18668	Grand Total for VK6 and 9 is 12878	
VK3					
HF Phone	9835	VK8		VK7	
HF CW	890	HF Phone	84	HF Phone	2657
VHF Phone	3464	HF CW	38	HF CW	33
TOTAL	14189	TOTAL	122	VHF Phone	181
		Grand Total for VK5 and 8 is 16788		TOTAL	2871

Licensees per Division are a follows: VK1 — 307; VK2 — 4830; VK3 — 6846; VK4 — 2492; VK5 — 1749; VK6 — 1394; VK7 — 579; VK8 — 170.

The following logs were submitted late and were not accepted for inclusion in the contest — VKs 2BTP/P; 3AWS/P; and 5APC.

INDIVIDUAL SCORES

VK1 High Frequency Section A (Phone)

Call Sign	Score						
PJ	845	LF	121	NEB	62	NUB	33
GB	508	KAL	114	DH	54	KEN	32
ZL	292	BAT	100	KCM	50	JX	29
HZ	196	GD	100	NMW	49	BBA	25
NCO	140	MX	100	KDE	44	TOTAL	3198
PP	137	FM	98	RM	41		
DA	122	NJP	70	RH	36		

VK1 Very High Frequency Section A (Phone)

Call Sign	Score						
KAL	181	7ZNP/1	80	LF	74	2PU/1	47
ZAR	130	ZJB	79	BAT	73	HZ	46
ACA	128	3XGV/1	79	KEN	68	KCM	37
GL	126	3KNP/1	79	MX	67	WI	35
ACC/P	103	KCB	79	UE	58	ZZD	31
GB	102	ZJR	78	KDE	50	JX	29
ZAH	94	ZXA	76	DA	48	FM	28
ZL	86					TOTAL	2171

Grand Total for VK1 is 5369

VK2 High Frequency Section A (Phone)

Call Sign	Score						
DLB	159	RE	101	AIC	59	FJ	41
DHU	158	CKM	100	KGX	58	CIP	40
ELB	155	CDG	99	AZS/1	54	DEW	38
COP	153	HT	99	HJ	53	AL	32
BID	140	EXA	99	VSN	52	BHO	32
ERJ	130	FUN	83	AJO	51	SW	31
PN	125	CKW	79	NV	50	ALU	31
SP	122	PY	75	CF	50	VMX	30
ALZ	120	UC	64	PKT	48	DOB	30
DUA	108	DJJ	63	GI	46	ACZ	28
SJ	103	DXG	62	BOT	41	BXD	27
IV	101					TOTAL	3522

VK2 Very High Frequency Section B (CW)

Call Sign	Score						
BQO	139	II	102	EO	52	AIC	37
KM	127	BHO	98	GT	50	PUG	34
EL	124	ZC	80	QL	50	ETE	34
TR	122	DQP	67	SU	42	ED	31
AOF	108	AZR	61	VM	40	TOTAL	1496
		DQL	60	JM	38		

Check logs were received from VK2s CWS and CDG

VK2 Very High Frequency Section A (Phone)

Call Sign	Score
HT	49
TOTAL	49

Check log was received from VK2ELB
Grand Total for VK2 is 5067

VK3 High Frequency Section A (Phone)

Call Sign	Score						
BUR	487	CPS/P	153	ZZ	106	AAM	50
BMV	481	BSR	133	VCC	108	MJ	49
APC	430	CAC	133	WIA	104	AMQ	49
CJW	400	NOH	128	CNE	104	BKN	48
PD	394	CQP	127	CGH	91	DRY	44
BRZ	355	ABP	125	BJM	90	PTR	43
PUB	343	DP	123	DFI	90	DWF	43
ADW	306	BY	120	BNN	85	PNP/P	37
DSI	294	AKK	120	VDG	82	NLR/P	36
YH	287	AVB	118	KPP	75	KDD	36
BML/P	257	AXE	117	KNM	75	AH	35
BSP	230	BFN	115	NBV/P	75	UV	35
KJI	222	CX	114	GA	72	AMD	35
AVV	210	CAD	112	OM	70	BMV	35
ZI	196	AGJ	112	QZ	66	PAF/P	30
BWZ/P	191	ZJ	110	BHS	63	ONM	29
XF	161	AYF	110	BII	52	RN	28
DBQ	157	BHU/P	109	BGY	51	TOTAL	9835
		JK	106	KF	50		

Check logs were received from VK3s ARJ and XH

VK3 Very High Frequency Section B (CW)

Call Sign	Score						
CCG	124	XB	75	BHU/P	45	VCC/P	31
YK	101	BDH	66	CGE	45	JI	30
DVW	96	BGH	64	KS	40	TOTAL	890
OG	80	RJ	58	BXA	35		

Check log was received from VK3AMG

VK3 Very High Frequency Section A (Phone)

CGH	471	BII	110	DKP	66	BYA	41
XPT	230	BY	108	BER	64	BZO	40
XDJ	201	YMT	103	DNM	61	CWA	39
APC	184	BFN	91	XH	52	OM	36
YSY	161	KRS	91	BIR	52	JK	36
BHN	155	CPS/P	89	BDB	44	YNB	32
YF2	138	ADW	78	BRZ	44	AOM	31
BHU/P	133	KPP	75	KCT	43	XY	25
YKT	115	BKN	71	CAC	41	TOTAL	3484
XNI	113						

Check log was received from VK3BSP
Grand Total for VK3 was 14189

VK4 High Frequency Section A (Phone)

Call Sign	Score						
SHB	308	AEM	138	ANU	60	PJ	37
YG	284	JM	121	BEM	60	ADY	34
AEV	260	QF	110	ASB	59	ALQ	31
VR	258	AAK	108	RT	58	PV	30
AOH	232	BG	103	YX	55	ZN	30
ZV	227	LT	102	ACW	55	AGS	30
BKM	224	AGL	100	SAA	51	CZ	30
RC	220	ABM	98	AMB	47	AOL	30
AOD	198	WIS	90	AOE	45	BPD	25
AOR	162	BRZ	75	KH	41	OX	25
BCS	160	NEL	73	AVR	40	UG	25
BTB	146	YN	68	KJO	38	TOTAL	4801

VK4 High Frequency Section B (CW)

Call Sign	Score						
XA	202	YG	66	SF	45	BDG	31
FB	75	XW	62	NUN	34	TOTAL	515

VK4 Very High Frequency Section A (Phone)

Call Sign	Score						
ZML	260	VR	97	AMA	43	PJ	31
AUR	238	AGO	87	AIA	41	BNL	27
ZKO	131	KH	80	BB	35	VS	26
AVR	108	ASB	48	QW	34	TOTAL	1286

Check logs were received from VK4s RX; BG; and YN
Grand Total for VK4 was 8602

VK5 High Frequency Section A (Phone)

Call Sign	Score						
BJA	637	ABX	165	GV	77	SCN	40
QX	600	BAR	151	AOZ	73	RK	36
FF	543	JSA	144	AGP	71	AIM	35
ADD	534	AAJ	138	NWT	70	FS	35
LZ	482	AJW	125	NOP	65	KJT	34
EE	472	AMT	125	OV	65	AOV	32
ACW	464	JJ	116	ATC/P	61	AWM	31
BYL	389	AAC	115	ST	61	WO	31
SU	376	PWJ	115	ABS	59	YX	30
ALE	373	AJG	111	KLJ	58	VY	28
ATN	369	IT	106	AMF	56	EC	26
ZN	351	TW	105	TP	56	DF	26
DK	333	SS	100	EA	53	KAK	26
DJ	325	RR	100	NIA	52	KGS	26
SJ	309	LL	100	KOP	51	ZB	26
NX	299	FN	92	AFM	51	RV	25
BI	280	AVJ	91	PBY	50	NPA	25
NOD	253	NF	87	KV	46	ADK	25
XC	200	AGL	85	YO	42	EA	25
ARC	199	BPA	81	NEI	40	TOTAL	12084
GZ	186	CO	79	NAC	40		

Check logs were received from VK5s HM; ANW; KX; ALD; BXG; and FX

VK5 Very High Frequency Section B (CW)

Call Sign	Score						
BN	184	GZ	93	BS	64	FN	27
AGX	157	ATU	89	FM	50	LI	25
UM	143	FX	74	TL	35	TOTAL	1151
BO	108	HO	72	JG	30		

VK5 Very High Frequency Section B (CW)

Check log was received from VK5ZB

VK5 Very High Frequency Section A (Phone)

Call Sign	Score						
JJ	230	ZDJ	120	ANW	67	AWM	41
KPM	229	KLH	108	KEM	65	ADR	36
KLJ	217	RV	104	ZAL	65	ADD	31
XI	179	OU	97	KCI	58	AVJ	31
ZHF	173	FN	92	OV	56	ATN	27
MX	159	YX	90	BAR	54	BXG	26
OZ	152	ZSV	76	ZTJ	51	KGS	26
BPA	149	TC	75	UE	48	ZKK	25
AAC	142	AIM	70	AOV	46	TOTAL	3451
ABX	121	AT	70	NX	45		

Check log was received from VK5FX

VK8 High Frequency Section A (Phone)

Call Sign	Score
DI	84
TOTAL	84

Check log was received from VK8NW

VK8 High Frequency Section B (CW)

Call Sign	Score
HA	38
TOTAL	38

Combined Grand Total for VK5 and VK8 was 16788

VK6 High Frequency Section A (Phone)

Call Sign	Score						
ED	455	DA	107	WL	66	ABM	44
XV	440	JP	103	UT	64	HI	41
CT	226	ACN	102	TO	62	OE	33
RG	224	LZ	102	AV	60	KY	32
MX	160	GL	101	LV	59	ANT	32
AMB	150	TX	89	QP	58	ABS	32
AOU	141	RZ	88	ARG	51	RO	31
MO	125	QN	75	RF	51	SAA	30
ANC	121	WU	75	NCE	50	HU	30
ZQ	120	AD	73	YL	48	NRA	29
CX	115	AP	68	SO	47	UW	27
ATE	112	HM	66	AR	46	AO	26
DM	26						
NPL	26						
AFA	26						
XZ	25						
TOTAL	4590						

Check logs were received from VK6s OH; ON; and DC

VK6 High Frequency Section B (CW)

Call Sign	Score						
HQ	179	AJ	89	SM	39	WZ	29
AFW	96	JU	56	ED	35	WT	27
				RZ	34	TOTAL	584

VK6 Very High Frequency Section A (Phone)

Call Sign	Score						
ZLZ	301	ZRY	191	SI	136	DC	53
LZ	287	SDW	189	DA	131	ML	52
XZ	252	WT	184	EU	119	UV	50
RO	250	YL	180	NS	101	AOK	50
CX	240	SO	179	VF	100	SAA	49
ABD	234	TX	176	TP	100	JU	46
YF	217	ACN	159	ZGA	100	KBL	40
ZMG	203	FC	157	PV	80	ABS	32
RG	201	ANC	155	OH	75	UU	29
WIA	199	ZBM	152	MM	74	ZTL	28
TO	198	ANI 151	ZRE	HM	71	ZAG	27
HU	197		149	HI	70	GA	27
WH	196	NE	145	ON	68	TOTAL	7185
ACG	192	JP	143				

VK9 High Frequency Section A (Phone)

Call Sign	Score
XZ	242
XJ	222
XD	55
TOTAL	519

Combined Grand Total Scores of VK6 and VK9 ware 12878

VK7 High Frequency Section A (Phone)

Call Sign	Score						
KC	434	VK	151	RM	60	BH	34
NW	308	NAI	134	NBF	60	AK	26
KZ	285	NIM	105	HD	58	OM	25
BD	272	JE	90	HW	50	TOTAL	2657
AL	171	FL	89	DG	41		
NCP	166	JU	62	BJ	36		

VK7 High Frequency Scetion B (CW)

Call Sign	Score
ZO	33
TOTAL	33

VK7 Very High Frequency Section A (Phone)

Call Sign	Score
RM	60
NW	56
FL	39
HD	26
TOTAL	181

Check log was received from VK7AK
Grand Total Score for VK7 was 2871

ZL High Frequency Section A (Phone)

Call Sign	Score
1AGO	112
3TX	66
4QY	44
4OP	35

P2 High Frequency Section A (Phone)

Call Sign	Score
9NJS	33

Section C (Receiving) High Frequency (Phone)

Name/No	Score		
John Hagen	507	L20283	109
L20349	217	L60036	99
L30371	185	L60068	59
N Desjardins	113	G Edmeades	44

Very High Frequency

Name/No	Score		
L10120	358	L50065	113
Greg Fullam	305	G Edmeades	96
David Owen	152	L60068	86

A non-scoring Check Log was also received from VK75A which was operated by the Mackay Radio Club

JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST 1986

Contest Period: From 0100UTC 15th March to 0700UTC 16th March 1986.

Object: To encourage portable operation on the amateur bands by Australian operators. This form of activity is intended to help operators to become familiar with portable operation and thus assist in training them for preparedness in emergency situations. Emphasis is placed on working between field day/local VK stations in a manner as might be expected in an emergency situation.

CALL AREA DEFINITION: a Within ones own call area. VK1 to VK1 etc.

b Outside ones call area. VK1 to VK2; VK1 to ZL etc.

Rules:

1 DIVISIONS: There will be TWO divisions — a 24-hours and b 6-hours. In each division the operating period must be continuous within the time period allocated for the contest.

2 SECTIONS: In each division there will be separate sections as follows:

a Portable Field Station, transmitting phone, single operator

b Portable Field Station, transmitting CW, single operator

c Portable Field Station, transmitting open, single operator

d Portable Field Station, transmitting phone, multi-operator

e Portable Field Station, transmitting CW. multi-operator

f Portable Field Station, transmitting open multi-operator

g Portable Field Station, transmitting VHF

h Home Transmitting Station, emergency powered

i Home Transmitting Station, mains powered

j Receiving Stations

3 STATION DEFINITION: A **portable field station** is one which operates from a power supply which is independent of any permanent installation. The power source must be fully portable, ie batteries, solar panels, wind or motor generators, etc. A station located in an automobile and completely self-contained, apart from antennas, is classed as being portable, whether in motion or not.

A **single operator station** is one where the work involved in setting up the station is carried out by one operator and where this operator is the one who makes all contest contacts from the station. This does not, however, preclude the operator from having such minimal support such as a log keeper, provision of food and drink, etc. This definition debars such practices as entering a Club Station using a single operator with massive support, in competition with stations which are set up and operated by an individual operator in the normal sense of the word.

It is considered that the terminology of **multi-operator station** is self explanatory.

4 INSTALLATION: No radio apparatus, including mast, antennas, feeder cables, etc, may be erected on the site more than 24 hours before the contestant/s begin/s operating.

5 BANDS: All amateur bands may be used **with the exception** of the 10, 18 and 24MHz bands.

6 CONTACTS: Cross band contacts are not permitted. Cross mode contacts are permissible, however they will count only as phone contacts for scoring purposes.

7 The size of any portable field day station shall be restricted to approximately that of an 800 metre diameter circle.

8 MULTI-OPERATOR STATIONS: Such stations will provide a separate log for each band. Only one transmitter may be used on a given band at any one time, be it operating in a phone or CW mode. Only one call sign may be used from a multi-operator station.

9 NUMBER EXCHANGE: The exchange between stations will consist of a number/letter combination comprising the RS/T report as applicable, followed by a serial number commencing with 001 and increasing by one for every contact. Should the number 999 be reached, the series must then be re-commenced at 001. Following the serial number, a letter must be added indicating the Section (a) through (i) in which the station is competing. eg Number sent by a multi-operator station transmitting phone for the first contact would be 59001d. Both serial numbers sent and received must be recorded in the station log.

10 SCORING: For Portable Field Stations — CONTACTS WITHIN AUSTRALIA:

a Portable/Mobile outside entrants call area — 20 points

b Portable/Mobile within entrants call area — 15 points

c Home Stations/Section H outside entrants call area — 10 points

d Home Stations/Section H within entrants call area — five points

e Home Stations/Section I outside entrants call area — two points

f Home Stations/Section I within entrants call area

— one point
CONTACTS OUTSIDE AUSTRALIA:
g Contacts with overseas stations, ie other than VK — two points
For Home Stations/Emergency Powered — CONTACTS WITHIN AUSTRALIA:
a Portable/Mobile outside entrants call area — 15 points
b Portable/Mobile within entrants call area — 10 points
c Home Stations/Section H irrespective of call area — five points
d Home Stations/Section I irrespective of call area — one point
NOTE: Home Stations/Emergency Powered must operate independently of mains power. Such a proviso serves to further the aims of the WIA to prepare operators for emergency situations.
For Home Stations/Mains Powered — CONTACTS WITHIN AUSTRALIA:
a Portable/Mobile outside entrants call area — 10points
b Portable/Mobile within entrants call area — five points
c Home Stations/Section H irrespective of call area — one point
11 VHF/UHF MULTIPLIERS: For contacts made on frequencies from the 50MHz band and upwards, the QSO points score for each contact is multiplied as per the following table:

DISTANCE	MULTIPLIER
Under 50 kilometres	*1*
50 — 150 kilometres	*5*
150 — 300 kilometres	*10*
over 300 kilometres	*20*

12 BONUS POINTS: For any contact made using a NATURAL power source, a bonus score of 10 points may be added. A Natural power source is regarded as one where power is derived from such as solar cells, wind, methane gas, etc, as well as from batteries which are completely charged by natural means. All power produced under this category must have been derived independently of commercial mains or the use of petroleum derivatives.
13 CW CONTACTS: CW to CW contacts earn double points. These points must be shown as claimed on the log sheet prior to the application of any multiplier or bonus points. *NOTE: See below regarding CW Trophy under Rule 22.*
14 REPEAT CONTACTS: Portable Field Stations and Home Stations under Section H may contact other stations within these categories (Section A to H) for repeat contacts provided that a period of at least three hours has elapsed since the last contact with the station concerned. Home stations operating under Section I may be contacted provided that a period of at least six hours has elapsed. This applies for each band and mode.
15 RECEIVING STATIONS: Stations in this section must record the serial number being sent by any of the stations operating in the contest within Sections A to G inclusive. QSO points scoring will be on the same basis as for Home Stations/Section I as per Rule 10 above. VHF/UHF Multipliers and Bonus Points as indicated under Rules 11 and 12 also apply.
16 REPEATERS: Operation through any active earth repeaters is not allowed for contact purposes, however, the use of such is allowable for the purpose of making contact arrangements. Contacts made using orbiting satellites or EME as a medium are acceptable.
17 MODES OF OPERATION: AM, FM, and SSB all count as PHONE operation. RTTY and CW are both regarded as being CW. It would not be expected that more exotic modes, such as SSTV or Fast Scan television would be used in this contest.
18 LOG FORMAT: All logs shall be set out under the following headings and in the order shown: Date; Time UTC; Call Sign; Band; Mode; RST Sent; RST Received; QSO Points; Multiplier; Bonus Points; Total Points Claimed. *NOTE: The last three columns need only be shown where applicable. Contacts must be listed in order of Time and Serial Number. Each log page must also carry a progressive Total Points Score Claimed at the bottom of each sheet.*
Scores Claimed must be calculated by first multiplying the QSO Points Score as taken from Rule 10 by any applicable multiplier from Rule 11 and then adding any Bonus Points as per Rule 12.
19 SUMMARY SHEET: A Summary Sheet must be included which indicates the following details: *For each contact for which a multiplier is applicable, the Serial Number of the contact and also details of the respective stations locations which apply to the contact.* Such details must include either latitude/longitude references for each station or some satisfactory proof by such as map reference or distance calculation as to the distance over which the QSO was conducted. For Bonus Points to be claimed, suitable evidence must be provided as to the method of Natural Power Generation employed. Such evidence could take the form of a photograph of the generating equipment used or a signed statement by another amateur showing his call sign, declaring that he has inspected the generating equipment referred to.
20 FRONT SHEET: Each log must be accompanied by a Front Cover Sheet which provides the following information: *Name; Address; Call Sign; Division (six or 24 hour); Section (A to J); Number of Contacts; Claimed Score.* This sheet must also indicate station location, equipment used, power generating system employed and in the case of Multi-operator Stations, a list of operators names and call signs, together with their signatures. This Front Sheet must also carry a declaration signed by a licensed amateur as follows:
DECLARATION — I hereby certify that this station was operated in accordance with the rules and spirit of the contest. Signed . . . . . Date.
21 MULTIPLE STATION OPERATION: In the case of operators who have entered the contest in the six hour Single Operator Section it is allowable for them, upon their return to their Home Station, to make contacts with portable field stations. For this purpose they must submit a separate log which will be regarded as a Check Log only; ie they cannot enter into more than one section of the contest for competitive purposes. Operators who are interested in providing more field day activity are encourages to adopt this practice where possible. It should be noted however, that the practice of Multi-operator Station participants considering themselves to be portable stations and making contacts with the portable field contest station so as to bolster that station's score is deemed to be not in the spirit of the contest, and as such, contravenes the intent of Rule 20.
22 CERTIFICATES AND TROPHY: Certificates will be awarded to the winner of each section in both the six and 24 hour divisions of the contest. The six hour certificates cannot be won by the 24 hour entrants. The Contest Manager also reserves the right to award other certificates where the effort made by a particular station is of special worthiness in his opinion.
The Highest CW Scorer outright in the contest, irrespective of the section of the contest entered, will receive a trophy in the form of the President's Cup to hold for a period of 12 months. This award is intended as an encouragement to operators to utilise the CW mode whenever possible.
23 DISQUALIFICATION: The general Contest Disqualification Criteria, as published on page 44 of Amateur Radio for August 1985, apply to this contest. It is again pointed out that you should read the above rules properly so as to understand them and ensure that your log does comply with the contest rules laid down.
24 LOG SUBMISSION: Logs should be forwarded to the Federal Contest Manager, Box 1234, GPO, Adelaide, SA. 5001. The front of the envelope should be endorsed **John Moyle Memorial Field** Day Contest. Closing date for entries is 2nd May 1986.

UBA SSB TROPHY CONTEST

To be held from 0600UTC 22nd to 1800UTC 23rd February 1986.
This annual event is sponsored by the Union of Belgian Amateurs. Participation is dominated by Europeans. Bands 10-60 metres can be used but are divided into the following classes:

a Single operator, 40 and 80 metres only, six hours — two hours on Sunday, 0900 to 1100UTC, other four hours free choice.
b Single operator, 40 and 80, only 12 hours.
c Single operator, all bands, only 24 hours.
d Multi-operator, all bands, full 36 hours.
SWLs — a, b, and c as above.
EXCHANGE: RS/T and QSO serial number. Belgian stations will include their province abbreviation.
POINTS: ON and ON Forces in Germany, 10 points per contact. QSOs with one of the French countries, one point.
MULTIPLIER: Each Belgian province plus a BSD/FBA worked on each band (maximum of 10 per band).
FINAL SCORE: Total QSO points times the sum of multipliers from each band.
AWARDS: Certificates to the top scorers in each class for each country.
Use a separate sheet for each band and a summary sheet showing the scoring and other essential information, including the usual signed declaration.
Mailing deadline is the 1st April 1986, to UBA HF Contest Committee, Galicia Jan ON6JG, Oude Gendarmeriestratt 62, B-3100 Heist op den Berg, Belgium.

RSGB 7MHz CW CONTEST

To be held from 1200UTC 22nd February to 0900UTC 23rd February 1986 on 7.000 to 7.030MHz.
The rules are the same as those used last year. Only single operator entries will be recognised. The following rules are for stations other than the British Isles.
EXCHANGE: RST plus a three digit QSO number starting with 001.
SCORING: Stations outside Europe score 15 points per contact.
MULTIPLIER: One for each different British Isle country prefix worked (G2, GC3, GD4, GI6, GJ8, GM3, GU5, GW8. etc). Maximum of 49 possible with no credit for GB prefix.
FINAL SCORE: Total QSO points times the country prefix multiplier worked.
AWARDS: Certificates will be awarded to the first, second, and third place winners in each section.
Include a summary sheet showing the scoring and a list of the country prefixes worked, and the usual signed declaration that all rules and regulations have been observed.
There is also a SWL section with the scoring the same as above, logging BI stations only. Record the call as well as the serial number sent. The call sign of the station being worked may only be repeated once in every three contacts logged unless it is a new multiplier.
Unmarked duplicate contacts will be penalised at ten times the number claimed. Logs containing in excess of five unmarked duplicates will be automatically disqualified.
Entries must be received by 21st April 1986 and be sent to RSGB HF Contest Committee, PO Box 73, Lichfield, Staff, WS13 6UJ England.

RTTY JOURNAL CONTEST

This is the fifth RTTY contest sponsored by the RTTY magazine in conjunction with 73 MAGAZINE and will be held from 0000 to 2400UTC, 22nd February 1986.
The same station may be worked once on each band. Single operator stations are limited to 16 hours of operation. Multi- operators may operate for the full 24 hours. Off times must be at least 30 minutes each and must be indicated in your log.
CLASSES: Single operator and multi-operator, single transmitter. Single and all band, 10-80 metres.
EXCHANGE: RST and a consecutive QSO number.
SCORING: Five points for contacts with Ws and VEs, 10 points for all other contacts. One multiplier point for each US state (48), VE province/territory, and DX country worked on each band.
FINAL SCORE: Total QSO points times the sum of the multipliers from each band.
AWARDS: Will be issued in each class to the winners in each DX country (minimum of 25 QSOs to be eligible).
DISQUALIFICATION: Taking credit for duplicate contacts in excess of two percent of the total, and other discrepancies will be deemed ground for disqualification.

Use a separate log sheet for each band, a dupe and summary sheet, and a multiplier check sheet. Indicate equipment and power used.

Mailing deadline is 22nd March 1986 to The RTTY Journal, 1155 Arden Drive, Encinitas, CA 92024.

CQ WW 160 METRE SSB CONTEST

To be held from 2200UTC 21st February to 1600UTC 23rd February 1986.

There are no changes from last year's format for this contest.

EXCHANGE: Signal report and QTH (no QSO serial number).

SCORING: Contacts with stations within own country count two points; with stations in other countries but the same continent, five points; with stations in other continents, 10 points.

The multiplier remains the same, each US state (48), Canadian areas (13) and DX country. (US and Canada are not country multipliers).

Mailing deadline is 31st March 1986 and logs should be sent to Don McClenon N4IN, 3075 Florida Avenue, Melbourne, FL 32904 or 76 N Broadway, Hicksville, NY 11801.

73, Ian VK5QX
AR

Further to the Honour Roll, which began on page 57 last month as a result of the Editorial in November magazine.

Ray Kilby VK7RK, is another amateur who has been a member of the Institute for fifty years. Ray borrowed the WIA Badge Block to incorporate it on his QSL card in 1935, and has been a continuous member since that time.

Ray has always held the VK7RK call sign since licenced and has remained in the Launceston area during his amateur days.

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685MHz — Summer: 7.064MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGEMENTS

Contributions this month have been received from Bob VK3ZBB and Graham VK5AGR. Acknowledgement for the information relating to the UoSAT satellites, which has been gleaned from various UoSAT bulletins is also duly given to the UoSAT team.

AMSAT-AUSTRALIA NEWSLETTER

Graham VK5AGR, the National Co-ordinator of AMSAT-Australia is now producing a monthly newsletter containing updated satellite news, orbital predictions, Keplerian data, and operating hints and techniques. The objective of the newsletter is to keep the amateur populous informed on the latest information available, and to realise funds for the funding of projects, or the purchase of an item/s of hardware for a future amateur satellite project; eg Phase-3C, Phase 4, or whatever. The cost of the Newsletter is $15.00 and cheques made payable to the WIA (SA Division) should be forwarded to Graham VK5AGR, 9 Homer Road, Clarence Park, SA. 5034.

To date, the Newsletter has been a resounding success within Australia, and now comments from overseas amateurs, who have received copies from friends in Australia, indicate that they too would like something similar in their own countries.

The Newsletter is basically an eight page compendium of the nitty-gritties that are relevant in the short-term, items that are basically out of date when printed in this column, due to the six-week lead time of AR. To date, it has included some small computer programs specifically for satellite determination, the latest telemetry blocks from OSCAR-10 and OSCARs-9 and 11. If you are at all interested in satellite communication, this Newsletter is a must.

HAND-HELD COMPUTER OFFER

The offer, previously published in the November '85 AMSAT column, is still open. The response to the original offer literally caught AMSAT-Australia by surprise. Consequently, there were some delays in delivery because additional supplies had to be obtained to fulfill the long list of orders.

However, stocks have been replenished and those interested should forward their cheques to Graham VK5AGR, as above.

For those new readers to this column who do not have access to the November issue of Amateur Radio, the offer is for a Sharp PC-1246, complete with software for OSCAR-10, written by Dr Karl Meinzer DJ4ZC. Along with your cheque for $70.00, made payable to the WIA (SA Division), also **include** your QTH's Latitude and Longitude so that your computer can be personally programmed by AMSAT-Australia. Hence, when you receive the computer, you simply turn it on, follow the simple instructions, and you will be given beam Azimuth and Elevation headings to OSCAR-10 from your QTH, along with other relevant orbital data.

OSCAR-10 APOGEES
February 1986

DAY	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st February										
	32 1984	0140:01	-26	157	94	38	100	27	111	7
	32 1985	1319:32	-26	333					248	6
2nd February										
	33 1986	0059:04	-26	148	99	30	104	19	115	-0
	33 1987	1238:35	-26	323					252	14
3rd February										
	34 1988	0018:06	-26	138	103	22	109	11		
	34 1989	1157:35	-26	314			247	4	256	22
	34 1990	2337:06	-26	129	107	14	113	4		
4th February										
	35 1991	1116:38	-26	304	245	1	251	11	260	30
	35 1992	2256:09	-26	120	112	6				
5th February										
	36 1993	1035:40	-26	295	250	9	256	19	264	39
	36 1994	2215:11	-26	110	116	-1				
6th February										
	37 1995	0954:40	-26	285	254	16	260	27	268	48
7th February										
	38 1997	0913:43	-26	276	258	24	265	36	274	57
8th February										
	39 1999	0832:45	-26	267	263	33	270	44	281	66
9th February										
	40 2001	0751:45	-26	257	267	41	276	53	294	75
10th February										
	41 2003	0710:48	-26	248	272	50	283	62	330	82
11th February										
	42 2005	0629:50	-26	238	279	59	296	70	42	81
12th February										
	43 2007	0548:50	-26	229	288	68	321	77	70	73
13th February										
	44 2009	0507:53	-26	220	307	76	11	80	81	64
14th February										
	45 2011	0426:55	-26	210	351	81	52	75	88	55
15th February										
	46 2013	0345:55	-26	201	45	78	70	67	93	46
16th February										
	47 2015	0304:58	-26	191	68	70	80	58	97	37
17th February										
	48 2017	0224:01	-26	182	79	61	87	49	101	28
18th February										
	49 2019	0143:00	-26	172	86	52	92	41	105	20
19th February										
	50 2021	0102:03	-26	163	92	44	97	32	109	12
	50 2022	1241:34	-26	338					245	2
20th February										
	51 2023	0021:03	-26	154	96	35	102	24	113	4
	51 2024	1200:34	-26	329					250	9
	51 2025	2340:06	-26	144	101	27	106	16	117	-3
21st February										
	52 2026	1119:37	-26	320			244	-0	254	17
	52 2027	2259:08	-26	135	105	19	110	9		
22nd February										
	53 2028	1038:39	-26	310	242	-3	249	7	257	25
	53 2029	2218:08	-26	125	109	11	115	1		
23rd February										
	54 2030	0957:39	-26	301	247	4	253	14	261	34
	54 2031	2137:11	-26	116	114	3				
24th February										
	55 2032	0916:42	-26	291	251	12	257	22	265	42
25th February										
	56 2034	0835:42	-26	282	255	19	262	30	270	51
26th February										
	57 2036	0754:44	-26	272	260	28	266	39	276	60
27th February										
	58 2038	0713:47	-26	263	264	36	272	48	284	70
28th February										
	59 2040	0632:47	-26	254	269	45	278	56	302	78

OSCAR-10 APOGEES
March 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st March										
60	2042	0551:50	-26	244	274	53	287	65	0	83
2nd March										
61	2044	0510:52	-26	235	282	62	303	73	58	78
3rd March										
62	2046	0429:52	-26	225	294	71	337	79	76	70
4th March										
63	2048	0348:55	-26	216	319	79	31	79	84	60
5th March										
64	2050	0307:57	-26	206	15	81	61	72	90	51
6th March										
65	2052	0226:57	-26	197	56	75	75	64	95	42
7th March										
66	2054	0146:00	-26	188	73	67	83	55	99	34
8th March										
67	2056	0105:02	-26	178	82	58	89	46	103	25
9th March										
68	2058	0024:02	-26	169	89	49	94	37	106	17
68	2059	1203:34	-26	344					243	-3
68	2060	2343:05	-26	159	94	40	99	29	110	9
10th March										
69	2061	1122:36	-26	335					247	4
69	2062	2302:07	-26	150	98	32	103	21	115	2
11th March										
70	2063	1041:36	-26	325					251	12
70	2064	2221:07	-26	141	102	23	108	13		
12th March										
71	2065	1000:39	-26	316			246	3	255	20
71	2066	2140:10	-26	131	107	15	112	6		
13th March										
72	2067	0919:41	-26	306	244	-0	250	10	259	28
72	2068	2059:10	-26	122	111	8	117	-1		
14th March										
73	2069	0838:41	-26	297	249	7	255	17	263	37
73	2070	2018:12	-26	112	115	1				
15th March										
74	2071	0757:44	-26	288	253	15	259	25	267	46
16th March										
75	2073	0716:46	-26	278	257	23	264	34	272	55
17th March										
76	2075	0635:46	-26	269	261	31	269	42	279	64
18th March										
77	2077	0554:49	-26	259	266	39	274	51	290	73
19th March										
78	2079	0513:51	-26	250	271	48	281	60	318	81
20th March										
79	2081	0432:51	-26	240	277	57	292	68	30	82
21st March										
80	2083	0351:54	-26	231	286	66	313	76	67	75
22nd March										
81	2085	0310:54	-26	222	301	74	359	80	79	66
23rd March										
82	2087	0229:56	-26	212	338	80	45	76	87	57
24th March										
83	2089	0148:59	-26	203	36	79	67	69	92	48
25th March										
84	2091	0108:02	-26	193	64	72	78	60	96	39
26th March										
85	2093	0027:02	-26	184	77	63	85	51	100	30
85	2095	2346:04	-26	175	85	54	91	43	104	22
27th March										
86	2097	2305:04	-26	165	90	46	96	34	108	14
28th March										
87	2098	1044:35	-26	340					245	-0
87	2099	2224:07	-26	156	95	37	101	26	112	6
29th March										
88	2100	1003:38	-26	331					249	7
88	2101	2143:09	-26	146	100	28	105	18	116	-1
30th March										
89	2102	0922:41	-26	322			243	-2	253	15
89	2103	2102:09	-26	137	104	20	109	10		
31st March										
90	2104	0841:40	-26	312			248	5	257	23

This offer is a service to you, the satellite communicator, by AMSAT-Australia, and a right bargain, at that, if the initial response to the offer was any indication.

AMSAT-OSCAR-10 IHU MEMORY FAULT

AMSAT engineers have confirmed earlier diagnoses that an AO-10 memory fault has developed. The fault will have no effect on operations or overall spacecraft longevity according to W3GEY.

The fault in the Integrated Housekeeping Unit (IHU) memory appears to have been caused by a heavy particle impact; possibly the debris of an energetic cosmic ray. The IHU memory has been designed to accommodate both soft errors, the kind that are encountered randomly and are one shot events, and so-called hard errors; one which represent a physical change in hardware and are permanent.

The IHU software can not only detect errors when they occur, but can automatically correct for most errors so as to avoid any serious consequences. The satellite is completely under computer control and any uncorrected software error could be devastating. The system is also designed to count the number of times the error-correcting feature has been used. This count comprises an index to the number of errors incurred.

Several weeks ago, engineers began to notice an increase in the number of hits experienced. It was unclear, at the time, whether they wore due to soft errors or one of several types of hard errors. A diagnostic software routine, designed by DJ4ZC, recently confirmed, however, that the errors are hardware-based. The fault has been identified in specific memory locations, Hex 0781 and 3D81. W3GEY points out that it is quite likely the fault lies in adjacent memory cells; adjacent real estate on the silicon memory die, itself. This could be due to either a latent manufacturing defect or the impact of a heavy particle. The area of memory affected is normally allocated to data rather than operating system so the overall prognosis is excellent.

The memory chips, 16k NMOS devices, were modified by AMSAT to reduce radiation susceptibility. The modification included a Tantalum metal slab on the chip and a brass enclosure. Nevertheless, an energetic cosmic ray, or the debris resulting from one can pass through many metres of lead, according to AMSAT.

Identification of a specific failure site by DJ4ZC eliminates several significantly more worrisome possibilities. Indeed, the error correcting methods chosen were designed to accommodate these anticipated, radiation-induced incidents quite well and the system seems to be working.

AMSAT-OSCAR-10 OPERATIONS

The operating schedule of AO-10 can change at short notice when attitude changes to compensate for approaching eclipses are warranted. In addition to monitoring the AO-10 beacon for early word on any changes, check into the AMSAT-Australia Net each Sunday evening (times are at the head of this column).

In recent weeks, the Net Controller, Graham VK5AGR, has been conducting an auxiliary Sunday net on OSCAR-10, location and schedule permitting, to allow limited licensees to participate in AMSAT-Australia activities. The times of operation for the OSCAR-10 Net are promulgated on the previous weeks nets.

UOSAT SPACECRAFT OPERATIONS

DCE MESSAGE SYSTEM VERSION 2

In January 1985, WA3ZIA/VE3 and NK6K developed DCE Message System Version 1 software. This software provided a way to use the DCE for the forwarding of short messages. It was rushed to completion and used to demonstrate the PACSAT concept at the Pacific Telecommunications Conference in Hawaii. Now, after two weeks working long hours at the UoS, NK6K and K8KA have written and tested, spacecraft and ground-station software for DCE Message System Version 2.

Version 2 will provide a solid foundation for further DCE tests, reliable demonstrations of low-orbit store and forward message systems, and perhaps some "production use" of the DCE to provide long distance amateur radio digital communications. Toward these ends, Version 2 supports several ground-station commands, uses the full 96 kbytes of DCE memory, can handle single messages up to 16 kbytes long, and can be used by either full or half-duplex ground-stations. DCE ground-station software running on the BBC micro-computers at UoS can exercise all of the functions of the DCE, and will provide a basis for ground- station software development on other computers.

Receiving stations, that are not within the satellite footprint of a DCE ground-station, will still be able to monitor DCE activity. When the DCE is idle, it transmits "title frames", and these transmissions will be switched onto the satellite downlink for 30 seconds during every loop through the OBC Diarys downlink schedule. (This 30-second window now occurs after the OBC Diary status window, which follows the WOD dump).

DCE title frames, or T-frames, are sent in the

same format as other DCE frames, as described below, and they contain a message number and the first line of text from the message.

GENERAL FORMAT OF DCE FRAMES
DCE frames all share the following format:

<10h> <03h> <cmd> <cmd not> <data length> <data> <crc>

Each byte is sent as an asynchronous character with eight data bits and no parity. Frames are preceded by several SYN bytes <16h> for modem synchronisation.

<cmd> — a single ASCII character specifying a DCE command
<cmd not> — the inverse of <cmd>. Can be calculated by <CMD> XOR FFh or by 255 minus <cmd>
<data length> — a single byte giving the length of the <data> portion in bytes. Data length is between 0 and 128 bytes
<data> — <data length> bytes of command data. This data can be either ASCII characters or binary bytes
<crc< — two bytes of cyclic redundancy check. The CRC is a type of checksum, and it covers everything from <cmd> to the end of <data>

STUFFING <10h> BYTES
In order to assure that <10h><03h>, the beginning of frame marker, does not get transmitted in the data field, all <10h> bytes, other than the one at the beginning of a frame are doubled. Repeat: during transmission, <10h> is converted to <10h><10h>. When receiving a frame, after the first <10h><03h> has been detected, all <10h><10h> sequences should be converted to a single <10h>.

CONTENTS OF A TITLE FRAME
The <cmd> in a title frame is 'T'. The contents of the <data> portion of a title frame are as follows:

Message number, 1 byte. If the first bit of this byte is set, the message is not complete, and the message title may be invalid.

Message length, 1 byte. This is the length of the message that is stored on the DCE. It is not the length of this title frame.

Multiply by 64 to get the message length in bytes.

Call sign of the station using DCE, nine bytes of ASCII. If no one is using the DCE, then this will be nine blanks.

Title of the message, the remaining <length> minus 11 bytes of the <data< field. This is the first line from the message stored in the DCE. The length referred to above is the FRAME LENGTH, which follows the inverted command. We subtract 11 from it to account for the message number, message length and call sign data.

When you decode title blocks, you will find that the title with message number 0 contains interesting information on the status of the DCE. Good luck, Jeff G0/K8KA.

COMPUTER PROGRAMS

A recent addition to the AMSAT-Australia software library is a tracking program designed to run on the AMSTRAD. This program is based on the Commodore Program AMS-2064. For information, please forward an SASE to Graham VK5AGR, requesting details.

PHASE 3-D FUNDING

Most readers of this column would be aware that the objective of the AMSAT-Australia Newsletter is to provide an avenue of raising funds for a future space project. Similarly, those people who utilise the Software Service and in appreciation make a donation for that service, are also providing funds towards that space project. Over the last 12 months, an amount of money has been gradually accumulating towards the objective that Graham VK5AGR first envisaged when he instigated the Newsletter.

Therefore, following discussions with Karl DJ4ZC, on the status of Phase-3D, Graham is intending to pass a percentage of the proceeds to AMSAT-DL as an initial donation, for an item of hardware for Phase-3D. As yet, it is unknown what area this donation will specifically fund, however it is hoped that with continued support for the Newsletter, and donations for the service provided

SATELLITE ACTIVITY FOR PERIOD 31 AUGUST TO 30 SEPTEMBER 1985.

1. LAUNCHES.

The following Launching Announcements have been received:-

1985-079A	Cosmos 1680	Sept 4	USSR
1985-080A	Cosmos 1681	Sept 6	USSR
1985-081A	Soyuz T-14	Sept 17	USSR
1985-082A	Cosmos 1682	Sept 19	USSR
1985-083A	Cosmos 1683	Sept 19	USSR
1985-084A	Cosmos 1684	Sept 24	USSR
1985-085A	Cosmos 1685	Sept 27	USSR
1985-086A	Cosmos 1686	Sept 27	USSR
1985-087A	Intelsat VA F-12	Sept 29	ITSO
1985-888A	Cosmos 1687	Sept 30	USSR

2. RETURNS.

During the period thirty five objects decayed or returned including the following satellites:-

1983-091A	Cosmos 1494	Sept 26
1985-043A	Soyuz T-13	Sept 26
1985-068A	Cosmos 1673	Sept 19
1985-076A	STS 51I	Sept 3
1985-077A	Cosmos 1678	Sept 12
1985-080A	Cosmos 1681	Sept 19

3.GENERAL.

As at Sept 9, 1985, 1047UT; 1966-100A ATS 1 was reported at 121.600°West, Inclination 11.808°.

SATELLITE ACTIVITY FOR PERIOD 1 OCTOBER TO 30 OCTOBER 1985.

1. LAUNCHES.

The following Launching Announcements have been received:-

1985-089A	(16107)	Cosmos 1688	Oct 2	USSR
090A	(16110)	Cosmos 1689	Oct 3	USSR
091A	(16112)	Molniya 3-26	Oct 3	USSR
092A	(16115)	STS-51J	Oct 3	USA
092B	(16116)	USA-11	Oct 3	USA
092C	(16117)	USA-12	Oct 3	USA
093A	(16129)	USA-10	Oct 9	USA
094A	(16138)	Cosmos 1690	Oct 9	USSR
094B	(16139)	Cosmos 1691	Oct 9	USSR
094C	(16140)	Cosmos 1692	Oct 9	USSR
094D	(16141)	Cosmos 1693	Oct 9	USSR
094E	(16142)	Cosmos 1694	Oct 9	USSR
094F	(16143)	Cosmos 1695	Oct 9	USSR
095A	(16169)	Cosmos 1696	Oct 16	USSR
096A	(16177)	PRC-17	Oct 21	China
097A	(16181)	Cosmos 1697	Oct 22	USSR
098A	(16183)	Cosmos 1698	Oct 22	USSR
099A	(16187)	Molniya 1-65	Oct 23	USSR
100A	(16191)	Meteor 3	Oct 24	USSR
101A	(16198)	Cosmos 1699	Oct 25	USSR
102A	(16199)	Cosmos 1700	Oct 25	USSR
103A	(16220)	Molniya 1-66	Oct 28	USSR
104A	(16230)	STS-61A	Oct 30	USA
104B	(16231)	Glomr	Oct 30	USA
*010B	(15543)	USA-8	Jan 24	USA

Notes:

* 85-010A USA-8 was omitted from earlier lists. The satellite was placed in geosynchronous orbit.

85-092A STS-51J was crewed by K.J.Bobko, R.J.Grabe, D.C.Hilmer, R.L.Stewart and W.A.Pailes. Payload included two Defense Satellite Communication Systems.

85-104A STS-61A was crewed by H.W.Hartsfield, S.R.Nagel, B.J.Dunbar, J.F.Buchli, G.S.Bluford, E.Messerschmid, R.Furrer and W.Ockels. Amateur Radio was carried on this mission.

85-104B Glomr is a Global Low Orbiting Message Relay.

2. RETURNS.

During the period 45 objects decayed or returned including seven satellites.

by the Software Library, will allow AMSAT-Australia to make further donations towards Phase-3D and other future satellite projects and programs.

de Colin VK5HI

AR

CAUTION, IT MAY BE LETHAL

A letter from John Wilkinson VK6ZJJ, points out that advice in the article in December's magazine, page 28, which was reprinted from RADCOM July 1982, on the subject of PCBs may be hazardous.

John provided a copy of an article in HAM RADIO, December 1983 — which stated that low temperature burning of PCBs can produce DIOXIN, the most poisonous and deadly substance that the human race has created. The HAM RADIO article is authoritive and rather frightening.

Do not attempt a flame test for PCBs unless you fully understand their chemistry and have correct safety equipment.

Thumbnail Sketches

Peter Brown VK4PJ
16 Bede Street, Balmoral, Qld. 4171

HAROLD BREMERMAN VK4HB

Harold was particularly well-known as the popular station manager of VK4WIA for many years. He was also Secretary and Foundation Member of the Brisbane DX Club, and he also served on the VK4 Council.

For these activities and other support of the WIA, Harold was awarded Life Membership of the VK4 Division.

By profession he was an engineer, and was holder of a City and Guilds Certificate, and Life Member of the IREE. Harold was also skillful with tools and instruments and his technical knowledge and administrative ability made him an asset to amateur radio.

Born in London in 1903, Harold obtained his First Class Radio Certificate in 1918. He moved to Australia in 1927.

Television interested him and he constructed a "Nipkow" disc which he declared redundant after a visit to England in 1938, where he saw the trend.

Harold retired about 20 years ago, but still retains an interest in Lodge work. Blondie, a familiar figure with Harold at earlier Conventions leads a quiet life these days.

AR

JOHN ATKINSON VK4RZ (ex VK2RZ, ex ZL1RT)

John was born at Blackburn, in the United Kingdom, in 1906, and came to Australia in 1912. Both coming to Australia, and becoming a radio amateur, were by chance.

The TITANIC to USA and Canada was more expensive than the slower AFRIC to Australia, so to Australia the family came, only to learn that tne TITANIC had sunk, but that many had been saved by use of the ship's radio.

Not long afterwards John, near Pennant Hills Radio, obtained access to a Ford coil and battery and transmitted a radio signal while receiving via a piece of lead across two 'Gem' razor blades. Twelve-year-old John, and a mate, with an intercom across the street, also constructed a more sophisticated transmitter and receiver and were able to listen to Chas McCluran, the only 'B' class station with a call sign in Sydney.

Penurious John successfully applied for, and obtained, a messenger boy post with Sid Colville, ex XQF, and Moore's Radio Shop. Remuneration was 10/- and transport from Parramatta was two shillings which left eight shillings to 'keep the home fires burning'.

John was with C & M for two periods and became friendly with 'many-of-note', including Sir Isaac Isaacs who was very proud of his library. Apart from selling receivers, C & M supplied basics for broadcast stations and John, as VK2RZ, remembers Clif VK4CG, obtaining parts for 4GR Toowoomba.

During 1926-28, John, with Sid as leader, operated the first equipment installed in an aircraft — both were members of the Aero Club. They used a battery receiver and a small prop driven 250V generator for transmitting. There was no long distance reception due to lack of shielding.

John helped Wally VK2SA fit Sydney police equipment in a van. The equipment was mounted in the prisoners area and the first offender caught, when told of how the radio had assisted in his capture, put his boot through all the unprotected tubes.

John opened his own business in New Zealand and operated with the call sign ZL1RT. Later he moved to Gatton, Queensland, and finally to the Gold Coast where his present house was built to cater for amateur radio, with his 'shack' perched some 12 metres above ground and also above the main roof.

The first SSB DXpedition to Tonga was carried out by John, who 'kept log' whilst three Tongans filled out QSL cards.

John, who has been retired for many years, and Joan, who is about to retire, are enjoying good health and we look forward to hearing John on the bands for many more years.

AR

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

Marlene VK5QO and Bev VK6DE, ALARA Editor and Librarian respectively when the photograph was taken in August 1985.

ALARA CONTEST

Well, I for one "had a ball", finally emerging from the shack somewhat dazed, bleary-eyed, and

FROM LEFT: Ian, Len VK2LM, Betty VK2AMU, Dorothy VK2DDB, John VK2ZOI holding Roger. FRONT: Peter.

gravel-throated, clutching a sheaf of papers in my hot little hand. I was greeted by the male members of the household with sighs of relief, and such remarks as "At last" and "What time's dinner?"

Though 10 and 15 metres were almost a write-off, (I only managed three contacts on 15, and none at all on 10) conditions on the lower bands, particularly 80 metres, were a decided improvement on 1984.

We were most appreciative of the many menfolk who joined us in making this fifth contest the best yet, sparing no effort to give us valuable contacts, and those unsung heroes — the OMs (mine among them) who minded the children, cooked the meals, washed dishes, and made frequent cuppas so that we could participate to the fullest.

The Contest was run along the usual friendly lines, and a good time was had by all.

There were two disappointing aspects:

the scarcity of DX contacts, no doubt due to lack of propagation. Very few were heard, apart from some of the ZLs

and the lack of novice YLs on CW for the Mrs McKenzie Trophy. One OM, in particular, hunted through the bands looking for novice YLs to whom he could give a CW contact, without success.

Hopefully we will have the results by next month's issue of Amateur Radio. Marlene VK2KFQ, has been burning the midnight oil to get them ready. She reports that logs started arriving on the 13th November, the first three being from OMs, VI5GZ, VK2CDB and VK4BRZ respectively.

By 1st December, 22 logs had been received — 13 from ALARA members and nine from OMs, another pointer to the keeness of the male participants. Once again — thanks to the OMs for participating.

NEW MEMBERS

Welcome to two new members, namely Nancy VK2NPG, who joined on 7th November 1985, and Betty KA5ONE, who joined on 20th November and was sponsored by VK4JFA.

WIA 75th ANNIVERSARY

Two ALARA members, Mavis VI3KS and Mavis VK3BIR were present as official ALARA representatives at the WIA 75th Anniversary Dinner. Both reported that the event was a great success, and was enjoyed by all.

Until next month, 73/33 Joy VK2EBX.

AR

WICEN News

On Saturday, 14th December 1985, the Central Coast WICEN was activated to take part in a search of the coastline near Avoca, for a fisherman who was washed into the sea the previous night.

Three walking parties set out, accompanied by WICEN operators who were equipped with two metre hand-held units and communication was provided between the search areas and the Police Command point on a nearby high point, about 1.5km from the coast. One operator was able to communicate on most occasions using only low power (about 100mW) yet the Police and VRA low band portables running around one watt were generally unreliable over the same path. (Perhaps two metres and probably high band (148- 174MHz) signals are more readily propagated in the type of terrain encountered than those at low band (70-85MHz)).

The search was scaled down after land, sea and air searches failed to find any trace of the missing person.

Operators taking part were VK2s TV; BJC; ZCO; DBC and TS.

Central Coast WICEN was again activated on 21st December by the Wyong SES Controller.

A fire in 22 000, 44 gallon drums of inflammable liquids (paint, nail polish, Araldite, silicon rubber, thinners, etc) produced a pall of thick black smoke which was causing concern to the authorities. WICEN operators kept a watch on the movement of the smoke and reported back to the Operations Centre using two metres FM. Most traffic was on the WICEN simplex frequency of 145.700MHz, but the Gosford Repeater was also used for a short time.

Operators who offered their services for this operation were VK2s TV, BUQ, ZCZ, ZCO, DET, TS, DBC, KAL, YFF and BJC.

Condensed from SMOKE SIGNALS Volume 14 Number 9

AR

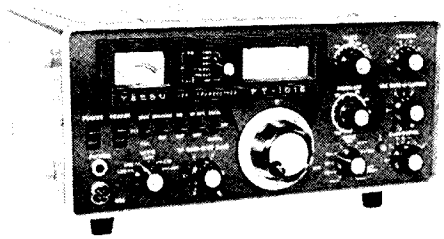
EARTHQUAKE APPEAL

At the conclusion of a three-hour concert at the Sydney Opera House, to aid the Mexican Earthquake Victims, the Ambassador for Mexico, HE Dr Jesus F Demene V, honoured Australian radio amateurs by presenting a plaque to Sam Voron VK2BVS. Also on stage with Sam were Ken Gallagar, Fred Greening VK2DZL and Martin Lansdown VK2PJW.

KNOW YOUR SECOND HAND EQUIPMENT

A Series to Help You Identify Amateur Equipment

Ron Fisher VK3OM,
3 Fairview Avenue, Glen Waverley, Vic. 3150



This month will be our last look at Yaesu for the present time. There are still several early models to look at, but these are not very common and, of course, there are many newer pieces, which are probably well-known.

We will look at them in due course, but for this issue we will look at the FT-101 in its various forms.

Without a doubt, this was the most famous series of transceivers ever produced, with the first 101 being introduced to the Australian market in late 1971. It was a much improved version of the FTDX-100, which was covered a few months ago in this column.

As all FT-101 transceivers had similar specifications, we will look at the common features first, and then check on the changes that took place as the series evolved.

The FT-101 was, in the first instance, an 80 to 10 metre transceiver, with operation on USB, LSB, CW, and AM. It was a self- contained unit with AC operation from 100 to 234 volts, and portable or mobile operation from 12 volts DC. Each band had 500kHz coverage and the 10 metre band used four positions of the band switch. Operation from 27.000 to 27.500MHz, 11 metre operation, was provided on all but the last of the FT-101E series.

All wanted facilities were included and these included VOX, Crystal Calibration, 1kHz Dial Calibration, Noise Blanker, and provision for an optional CW filter.

The circuit was all solid-state, except for the transmitter final stages which employed a 12BY7 driver and two 6JS6s in the final. The receiver circuitry was changed from time to time with the noise blanker getting quite an amount of attention. Receiver front-end-overload was always a problem with the 101s and as it later evolved, the problem was in the IF section. Many modifications were published over the years, some good and some not so good. At the conclusion of this article several that were published in AR are itemised.

The first 101 can be identified by the two position MOX/PTT-VOX switch. Later models had a three position switch here for MOX/PTT/VOX. Early models are usually considered to be serial number 25000 and under, but there are at least two versions that come into this category. In Australia, the latter models or the early series became known as the series two. These had the 160 metre band included as a standard feature. Also an improved noise blanker and a final stage cooling fan. One quick way of identifying the early models is the colour of the front panel surround. This was silver until the introduction of the 101B, when it was changed to light grey.

The 101B arrived on the market around August 1974. The 'B' had an upgraded SSB filter and further improvements to the noise blanker.

The first 101E arrived in June 1975. There were two improvements in this model. Firstly, an RF speech processor was included and the front panel slide switches were replaced with easier to use toggle-switches. The original RF processor proved to be rather hard to use, as there was no front panel adjustment. As the drive requirements changed from band to band, so it was necessary to dive into the chassis to alter the preset control.

The second series 101E overcame this problem by providing a processor level control, concentric with the clarifier knob. Improvements were also made to the processor itself, which gave better clipping action with lower distortion.

The final model of the 101E was the same in all respects except that the 11 metre band was removed. In the USA this unit was known as the FT-101F

Yaesu made some changes to the noise blanker in the 'E' series that did not please all customers. The local Yaesu agent did a brisk trade selling 101B blankers to install in the deficient 101Es.

There were two economy versions of the 101E, the 101EE, which omitted the RF speech processor, and the 101EX that did not have the 12 volt DC supply or the RF speech processor. Both models are quite rare, but watch for them when buying second-hand units, so you don't get caught. They will bring a somewhat lower price.

FT-101 transceiver were sold over a period of several years, but there was only a relatively small variation of price. The first were advertised for $675 and $640 by two different advertisers, but the 101B actually dropped to $579, while the 101E was $700.

Second-hand value is dependant on condition. There are some very rough examples around, however, in good condition without too much paint damage, I would suggest the following prices as a guideline.

Early 101 (no 160m) $275. Later 101 (with 160m) $300. 101B $325. 101E around $350. 101E, later version 375. Beware of sets that have been modified and have no written information about what the modifications were. If things go wrong you could be in trouble.

Here are a few 101 articles which appeared in AR. *FT-101B Review — February 1974; FT-101 Modifications — August 1973, September 1973, June 1973, March 1974, November 1974, September 1975, October 1975, May 1975, March 1975, December 1975.*

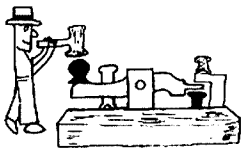
ESTABLISHMENT OF THE CENTRE FOR TELECOMMUNICATIONS DEVELOPMENT

Following the decision of the ITU Administrative Council to establish a Centre for Telecommunications Development within the framework of the Union in Geneva, the Advisory Board of the Centre held its first constitutional meeting at ITU Headquarters from 21-23rd November 1985.

The Board, which will assure the overall direction of the Centre, comprises 21 members, including the ITU Secretary-General as Senior Vice-Chairman (ex officio), the remaining 20 members being personalities drawn from different regions and interests — resource providers and beneficiaries.

The idea of the establishment of a Centre for Telecommunications Development was conceived by the Independent Commission for World-Wide Telecommunications Development and was endorsed by the World Telecommunications Development Conference held in Arusha, Tanzania, during May 1985. The Commission had concluded indeed that in its view "the scope of assistance (to developing countries) has to be expanded and the machinery for providing it rationalised if the scale of improvement that is needed is to be achieved". The Commission went on to say "that to make this assistance effective, the arrangements through which it is provided need to be revised and strengthened".

The ITU Administrative Council at its 40th Session in July 1985, endorsed the general thrust of the conclusions and recommendations of the Commission's Report, and decided accordingly to establish the Centre.



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

KEYS AND KEYERS (Part II)

Last month we talked about straight and mechanical keys and the 'manual keyer'. Let us continue with electronic keyers and paddles. The simplest electronic keyers rely on a single paddle to drive them. When it is swung to one side, a series of dots is generated; dashes result from a swing to the other side. This sort of paddle is called a side-swiper, after the mechanical key.

The length of time the paddle is held over determines the number of dots or dashes generated.

The iambic keyer represents the state of the art at the present time. Any number of frills, bells and whistles are available, but as a keying method, iambic is of tremendous significance. The keyer is actuated by separate dot and dash paddles, but when both paddles are held over at the same time, the lambic keyer generates a pattern of alternating dots and dashes. That is where the name iambic comes from. It is a term used in poetry to describe a 'meter', or rhythm consisting of a pair of syllables, the second of which is stressed. For the record, if iambic meter is reversed, with the first syllable stressed, it is dactylic, and an iambic keyer sends dactyls if the dash lever is actuated in advance of the dot lever! With a view toward making this all clearer, here is an example of an iambic meter: *"In days of old, when knights were bold. . ."* A technique, called scansion, is used to analyse the meter, and the line breaks up like this: *In DAYS / of OLD / when KNIGHTS / were BOLD. . .* The rhythm is often described as *"de dum de dum de dum de dum,"* or by extension, *dit dah dit dah dit dah dit dah. . . get it? ?*

To send SK with a hand key requires 12 separate up and down movements. To send it iambically, the dot paddle is held over and the dash paddle is kicked in at the end — for a grand total of four movements:

1 — press dot 2 — press dash 3 — release dot 4 — release dash.

It sounds complicated, but the fewer the required movements, the easier the keying becomes. Great speeds are possible once you get the hang of it. Most people start off using an lambic keyer non-iambically (they depress one paddle at a time and don't use the combinations available with a squeeze), and then find their way into iambic keying, as time goes by.

An iambic keyer is driven by dual paddles, and there are various ways to go about engineering them. The simplest method consists of two paddles which are held by a spring tension so that they can be swung inwards, against a common centre post. This principle Is used In paddles such as the HK1, which is used external to the keyer, and the same principle is used in less rugged paddles which are often used where paddles are built into the keyer.

More esoteric, but a delight to use, is the Bencher paddle. Each of the two paddles has its own post, so the contacts meet flush, rather than a flat contact meeting a round centre post, and they are capable of very fine adjustment.

The Bencher Is not cheap, but then again, it is not a lot more expensive than the others, and you get what you pay for.

As far as the keyer itself is concerned, the best introduction is to build one. There is a Heathkit keyer, but a less expensive alternative is based on the kit marketed by a local electronics firm, some years ago. It originated with WB4VVF, in QST, and was later published In Electronics Australia. Unfortunately, the kit, as such, is no longer available, but you should be able to find the circuit board, the Galbraith paddle (GK1) and, I presume, the instructions. The ICs and other components are readily available. In the original design the paddle was built into the keyer. I prefer a separate paddle, so I put all the controls on the front panel, and jacks for all the externals on the back. I modified the design to use a plug-pack for power, and put in a switch for speed control, rather than a pot, so selected speeds could be set quickly. It was also simple to add a rectifier circuit, so the keyer can be driven by a cassette recorder — an alternative, which seemed easier than building a memory for it. The paddle would be, by far, the most expensive part — other than that the whole thing should cost less than $20, plus a few hours to construct it.

If you are thinking of buying a keyer, ready-made, there are dozens on the market to choose from. The basic iambic keyer circuitry has been reduced to one IC now, the Curtis 8044, and there is a Vibroplex paddle, with a complete keyer built into the base! There is another, the name of which could be misconstrued, which has the keyer attached to a Bencher paddle.

Beyond the basic keyer circuit, which gives you dot and dash memory, automatic spaces, and a variable speed and weight, the main attraction of more advanced keyers is memory. A memory is very handy during ordinary operations, but for contesting, it is almost mandatory. In choosing a memory keyer, you need to work out the size of the messages to be stored, and the ease of storing, editing, and using them.

Perhaps, the most advanced line of keyers on the market today is produced by Advanced Electronic Applications, of Lynnwood, WA in the USA. Their top-of-the-line 'Morsematic MM2' keyer has to be seen to be believed. Featuring two microcomputers, the MM2 will act as a contest keyer, automatically generating serial numbers, as a beacon, sending a programmed message at programmed intervals, and as a trainer, in addition to ordinary keyer functions. In trainer mode, the MM2 can be programmed to start at any speed between two and 98 WPM, and, after an elapsed time of 0.1 to 59.9 minutes, it will have increased to any higher speed between two and 98 WPM. It will generate random characters, or words, but if you want to check progress, you can select one of ten starting positions for use with the Answer Book.

The AEA range also offers keyers with fewer of the MM2's features, such as the CK2 contest keyer, and the KT2 keyer/trainer. The "2" in the name represents the second version of the keyers, using CMOS circuitry for lower power consumption and longer memory. The "1" series have most of the features of the newer line, but are less expensive, if you can still find them.

AR

Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Conditions on the higher frequencies have markedly improved lately, especially after our local sunset. The 21MHz band, in particular, has improved with many European signals coming through reasonably well. Signal levels are not a good as they were last summer, but that is only to be expected at the Sunspot Minima.

As well, we have found that the lower frequencies are plagued by static and noise from all the summer storms we have been having.

E OPENINGS

I did also notice several good Sporadic-E openings around the Summer Solstice. One went as high as 144MHz and some local VK7s took advantage of it to work ZLs on 144.100MHz SSB and even reportedly got some to come up on the local FM repeater, which certainly stirred things up a bit. There have been strong signals on the 10 and 15 metre amateur bands, particularly from NSW and SA. I also checked the 27MHz CB calling channel, which was bedlam with so many calling at the one time. It usually is comparatively inactive, locally.

Another indicator of good Sporadic-E are signals from the Radio Australia sites at Shepparton and Lyndhurst. These sound as good as a local MW station when Sporadic-E is present. In fact, several RA harmonics were heard, but these are well down and within limits. I have used RA for many years as a beacon for Sporadic-E.

CLANDESTINE OPERATIONS

Recently I received a QSL card from a clandestine station that I heard in 1984. The station took 19 months to reply, but it was worth it. The report I sent was to a Miami, Florida address I had been given. The station gave the call of *"La Voz dell Cid — Cuba Indiepente y Democratica"* and broadcast popular music which was interspersed with slogans. This station has been around for a number of years, buying air-time over various Latin commercial stations. However, they were certainly using a clandestine operation for they were on 10.041MHz, well within the HF aviation allocations.

I thought that the station had rejected my report, as it was in English. I was aware that other listeners had obtained QSL cards for Spanish reports, which incidentally were sent to Central America. I was surprised that my report turned up 19 months later, but from Costa Rica. It came in a plain air mail envelope, minus any identification or return address. Inside there was a colourful card, with the CID logo and the basic details. On the reverse side were details of other CID transmissions. There was no identification of the transmitter site, although various theories have been advanced, the common being either in Central America or within the USA.

I haven't heard it lately as it has been absent from 10MHz for about 12 months. I did hear it faintly earlier In the year, in the middle of the crowded maritime allocation on 6.300MHz. I presume they are still using various Latin commercial outlets. Yet now there has been an official "Clandestine" — Radio Marti with identical programming and target audience, utilising VOA facilities. Perhaps this is why "La Voz dell CID" is not heard often these days.

NEW TALKBACK TIME

By the time we are reading this, these openings will have diminished and the propagation will have altered. By now, propagation to North and South America should have improved on 15 and 20 metres. The higher frequencies should start to drop off and LP signals from Europe should be coming earlier. I find that the propagatlonal forecasts, prepared by Mike Bird for both Radio Australia's "Talkback" and "Media Network" over Radio Netherlands, are extremely valuable. They are easily understandable to the beginner or to those further advanced. Incidentally, Radio Australia's "Talkback" is now aired at 1610UTC on Fridays and Is repeated at 0310, 0810, or 1230UTC Saturdays over the usual RA channels.

Well, that is all for this month. Until next time, the very best of 73 and good listening — Robin VK7RH.

AR

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

Today I sat in front of my trusty typewriter, with a blank piece of paper and wondered just what I would write about this month. I think everyone who has ever attempted to put an article together has had this experience, and I am no exception. If I were a more methodical person, which I am not, I would have my thoughts in order before I start hitting the keys.

Whilst watching television recently, a flautist appeared on-screen playing a most delightful tune. As I watched, my mind was drawn back to earlier days and another flautist, Army Signalman Col Evans, playing Carnival of Venice. This was the first concert held for about 600 troops who had just arrived at the 67 mile post in the Northern Territory, after a tortuous two weeks trip from Strathfield, Sydney.

I well remember this concert — *the first real-live-concert, under starlit skies with the smell of citronella and the buzz of mosquitos* — not only for the fact that there were no enemy bombers flying overhead, but, during Col's rendition of Carnival in Venice, a large number of mailbags arrived with welcome news from loved ones. (The last I heard of Col was many years ago when he was a member of the ABC Orchestra).

Previously, I have written of other experiences in the Northern Territory, during the war, and I am always intrigued with news from that area. Not so long ago, whilst listening to Radio Australia, the medium wave relay for Darwin, Tennant Creek, and Alice Springs, I heard that Tennant Creek and Alice Springs are competing with each other to see which town can entice the most tourists to see Halley's Comet, in Central Australia. I also read that Bill Peach, of television fame, is taking a party to the same area to view Halley.

After the Northern Territory, I was stationed at Morotai Island, in the then Netherlands East Indies, and I would now like to write of my experiences there.

After some refresher courses, vaccinations, etc I eventually found myself at a Brisbane wharf for the journey north in the FREDERICK C AINSWORTH, a formidable looking warship from the United States of America. Once on board we were issued with live ammunition as we were to sail through enemy infested waters.

Firstly, we were kept below decks, but as soon as we had cleared the Brisbane River and were in the open sea we were allowed to see sunlight once again. We didn't know where we were destined for but by observing which way the sun rose and set, and the approximate speed of the ship, it was possible to assume a rough estimate of where we were located, from day to day.

The FREDERICK C AINSWORTH headed through the Coral Sea towards Milne Bay, and it was whilst on this leg of the journey that I engaged the wrath of the Military Police. In the Coral Sea area, at intervals of about half-an-hour we saw two ships stuck-fast and abandoned on the coral. They had been there so long that it was possible to see right through the gaping holes in their sides. I promptly went off to my bunk and returned with my camera — a forbidden article on a troop-ship like the FREDERICK C AINSWORTH.

I had taken a couple of photographs when suddenly I felt a strong arm on my shoulder, and I was spun around to face a military police sergeant who had caught me 'red-handed'. He demanded I hand my camera over to him, but I refused as there was still some unexposed film in the camera and film was difficult to come by. I was then forced to accompany him for a visit with the military captain who was in charge of the ship.

He ordered me to hand the camera over to him and he duly tore the film up and confiscated the camera until we arrived at our destination. He then said, *"I understand you have a radio aboard, also".* (Now, I thought no one on board knew I had parts for a battery-operated radio at the very end of my kitbag.) *"Yes, I do have the parts of a radio which I was building at Bonegilla Camp, but it is not all put together yet and cannot be operated".* The fact that it was not operational made no difference to him and I was sent to retrieve the equipment and hand it over to the captain who would return it to me upon arrival at our destination.

Before throwing him a final salute I attempted to find out how he knew of my radio parts, but he became quite livid and dismissed me.

Next time I will continue my story of life on the FREDERICK C AINSWORTH and arrival on Morotai Island.

73 till then, Joe.

AR

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

February already! It is amazing how the time goes by.

VK intruder reporters will be pleased to hear some news from Bob ZL1BAD. At a conference held in New Zealand late last year, the Indonesian representatives have extracted a promise from their administration to shift the station on 7.098MHz. This will allow amateur operators a little more elbow-room in their section of the 40 metre band.

WILL THIS MOVE

The US State Department has sent another complaint to the USSR, re the naval intruder, UMS, and we wait to see if this complaint has any effect, bearing in mind that the USSR has already promised to have the station QSY.

NEW CO-ORDINATOR

The JARL has appointed a new Monitoring Service Co-ordinator. He is Fujio Yamashita JS1UKR. We wish him well, and hope he can inspire the JAs to increase the number of intruder reports from Japan, which is, of course, in IARU Region 3, as Australia is.

JAMMING

Radio Peking, on 7.035MHz, has been suffering a lot of jamming. *I wonder who could be doing that?* Radio Tirana, Albania, often suffers the same fate. The point being, of course, that the jamming stations increase the QRM to amateur operators on the band.

Anyone with RTTY facilities might like to let me know what the signals are on 7.001MHz most nights before 1300UTC.

RESIDENT INTRUDER

At the time of writing, the nuisance intruder on 14.032MHz seems to have taken up residency there, and I would appreciate any information on that one. He uses FAX and some RTTY, with continuous Morse 'dahs' whilst he is keeping the frequency reserved.

NOVEMBER STATISTICS

The statistics for last November are as follows:

Broadcast intruders — 417; CW intruders — 117; RTTY intruders — 95; other modes — 65; and 80 intruders identified.

Thanks to VKs — 2KPI, 2PS, 3AMD, 3XB, 3XU, 4AKX, 4BG, 4BHJ, 4BN, 4BTW, 4KAL, 4KHZ, 4MR, 5BJF, 5GZ, 5TL, 7DQ, 7RH and Mr A Bradford for supplying reports of intruders for November. Don't forget to let us know if you hear anything that sounds like a taxi-cab operation coming from Asia on the 10 metre band. This may turn out to be a real problem.

See you next month, and I wish you good DX.

AR

THEY WERE AROUND THEN TOO!

Pirates were apparently rife in 1925, as the following excerpt from The Listener In, 12th September 1925 stated:

"The Northcote and District Section of the WIA wishes to warn the pirate who is operating a spark set in this district that every member will do his best to locate him and notify the authorities. One of the members has offered his car and a loop aerial will be used to find this nuisance. This Club will do its utmost to eliminate these pirates"

Wonder if they caught him, eventually!

EDUCATION AND EXAMINATIONS

As a result of a recent meeting with the Department of Communications, to discuss education matters, one or two points require some feedback to assist the Federal Education Officer. The Federal Education Officer would like to hear from candidates who have, since **May 1984,** sat for both AOCP and NAOCP theory on the **same day.** The DOC is surveying results of those people to compare the marks obtained. What the FEO would like to hear is comments from candidates who have sat both papers on the same day, as to the relative standards of the papers from the candidate's point of view.

A further question raised by the Department was the Novice Certificate and Licence. *How do holders of this qualification feel by being called "Novices"? Do Novice operators consider the term derogatory in any way?* Your thoughts on this matter would be appreciated.

The third and final question on which feedback is requested, is the idea of a single examination paper for both levels with different pass marks. In view of the new examination fees, this could be a factor that needs consideration. Suggestions so far have been for two sections on the one paper, an optional extra section or a single paper with certain questions that need to be answered correctly to obtain AOCP.

It is important though, that the difference between the two levels is maintained.

By putting these three questions to members it sounds as if we are dithering and expecting members to make decisions for us. This is not so, we are seriously seeking the opinions of members to assist in the formulation of policy.

REVISED EXAMINATION SYLLABUS

The syllabus, in leaflet form, has been reprinted by the Department of Communications and is now available. It is suggested that classes commencing in the New Year work to this syllabus.

Any feedback or questions about education should be directed to the Federal Education Officer, Brenda Edmonds VK3KT, QTHR.

Club Corner

HADARC

This month's meeting of the Hornsby and Districts Amateur Radio Club is hoped to be a Lecture plus Practical Demonstration of the Commercial High Speed Data Transmission System X25. It is anticipated that members will be able to bring along their own computers and participate in the demonstration.

From QUA, here is the news of HADARC Nov/Dec 1985 **AR**

'DEVIL NEWS FROM THE NW BRANCH

The Florians' broadcasts on RTTY are getting a lot of response, and there are quite a number of reports to hand.

The Map Reading exercises conducted by John VK7ZPT have proved very popular (there were three classes last year), and it is hoped to conduct some more this year.

The branch has been looking into ways to cut costs in amateur radio. VK7WZ thought it would be handy to make boxes for projects and duly made a bending device for this purpose. Whilst he was visiting a local service department he inquired of the fate of many washing machines which were destined for the rubbish dump. He was told he could take what he wanted and these became boxes suitable for amateur radio projects.

VK7KY has been fortunate to locate a source of old television receivers which are proving an invaluable money saver for components, and in some cases, some television cases can be used for shelving.

The picnic to Bells Parade, Latrobe, during November was a great success, particularly the cricket match which was held on the banks of the Mersey River.

Bob VK7NAI and his family together with John VK3DJM and his mother were welcome visitors to the event. John and his mother were touring Tasmania and welcomed the opportunity to meet the amateurs from the NW Branch.

Several video cameras were seen in operation so there will probably be an interesting film night at a meeting in the near future.

At the last meeting for 1985, the Annual General Meeting, ladies were invited to attend. It was pleasing to see nine wives present. Together with three visitors and 28 members and associates, it was good to see such a large attendance for the occasion. Visitors were VK4APQ, VK7ZFH ex VK5ZFH, and Daniel.

Officers read their reports for the preceding 12 months, and thanked members for their assistance and support.

The Branch Award, which is in memory of Joan Fudge VK7ZYL, a member who worked so industriously for the Branch, was presented to Tony VK7AX, for the help he has given to the club.

Officers for 1986 are: *President — Bob VK7KAB; Vice-Presidents — Ross VK7WP and John VK7KDR; Treasurer Bruce VK7MB; Secretary — Tony VK7AH; WICEN Co-ordinator — John VK7ZPT; Activities Officer — Greg VK7ZBT; RTTY. — Florian Biner; Weekly News Officer — Frank VK7ZFH; QSL Officer — Max VK7KY; Publicity — Ron VK7RN; Librarian — Terry VK7BV. There are two positions not filled, Youth Affairs and Components and Equipment.*

Arthur VK7SE; Ivan VK7XL; John VK7KDR; Steve VK7EQ; Greg VK7ZBT and Frank VK7ZFH were selected for the Broadcast Sub-Committee.

Max VK7KY is working industrially on a Club OSL card design and he should just about have it right by now.

Ron VK7RN, advised club members with modems for computers to disconnect them during storms. Storms can be very damaging as Ron has discovered.

Congratulations to Andrew Hay, who is awaiting the allocation of his limited call sign.

Many thanks to the people who have helped me with the news for the past year, particularly my wife Shirley and Greg VK7ZBT. Anyone with any news of interest please contact me or write to the club address: PO Box 194, Penguin, Tas. 7316.

Contributed by Max Hardstaff VK7KY
AR

GOULBURN AMATEUR RADIO SOCIETY

It was a joyous occasion for Anne and Bill Garvey recently when they were handed their naturalisation papers by the Mulwaree Shire President, Cr Laurie Sadlier. The Garveys, from Taralga, near Goulburn, came to Australia from Birmingham, UK, in 1955. Bill is probably better known as VK2CWG.

Bill has been a licensed amateur since 1978 and previously held the call signs VK2VCO and VK2KWG. He is well-known on the HF bands, especially 80m and holds a Novice DXCC as well as DXCC for 80m. He is also a well respected member of the Goulburn ARS.

Contributed by David Thompson, VK2BDT Secretary with photograph courtesy of the GOULBURN POST
AR

MILDURA AMATEUR RADIO CLUB VK3 PADDLE BOAT CITY BUR

P.O. Box 1294, Mildura, 3500, Victoria, Australia.

THE MURRAY RIVER FLAG

MILDURA ARC

During the WIA, Victorian Division celebrations in late 1984, the Mildura Amateur Radio Club were given the use of VI3WI, along with other clubs and individuals.

The Club had the use of the call sign during the CQWWDXCW Contest, and it was utilised for a multi-operator, single transmitter station.

Upon perusal of the results of this contest, it appears that VI3WI won its category. Whilst it was no record-breaking result, it gave almost 1000 amateurs, world-wide, the opportunity to work a special call sign, and in so doing, publicised the WIA.

The Club was thrilled with the results, as this was only the second contest entered and it was quite awesome trying to work the "dog-piles" for hours on end. Hundreds of CW signals, one on top of another were not easy to decipher.

During the majority of the contest, sub-barefoot power was used (less than 50 watts), as there was a problem with chronic television interference. (Operation was held at the QTH of VK3BPW, in Ouyen, where television reception is only marginal, as they are in a fringe reception area). There was also an eight-hour power black-out.

Due to the black-out, a generator was rigged up but this exploded the main transmitter — it was later discovered that the generator had voltage spikes exceeding 900 volts!

Coupled with massive power line interference, heaps of coffee, and even more paper work, in retrospect, it was a contesting experience of a lifetime.

VI3WI was VK3BPW and VK3CWB (operators), and VK2EFJ, VK3DWN and VK2KFQ (log-keepers).

Contributed by Maurie Milani VK3CWB
AR

NORTHERN CORRIDOR RADIO GROUP

Recently in the northern area of Perth, a number of amateurs banded together with the aim to forming some type of club. Unknown to them, another amateur group had made similar plans. Both groups suddenly discovered each other when they tried to book the same venue for meetings!

Surprised, but gratified by the similarity of aims, the groups joined forces and launched the Northern Corridor Radio Group (NCRG).

The NCRG meets every second Tuesday at the library foyer in Carine Technical College, at 7.30pm. In the case of college/school holidays, meetings will be held in room 101. After meeting in the foyer, we can move to the lecture theatre, canteen, or garden, depending on the agenda and weather.

Meeting activities include videos, lectures, demonstrations, discussions, Morse classes, general chit-chats, and more. The group has also visited places of interest, one being a visit to radio 6WF and the regional shortwave station, near Hamersley. All gazed upward in awe at the base of the 182m (600ft) plus tower, and decided it would be nice to borrow for 160m in the next contest! The 50kW output valves looked decidedly unfriendly.

Another successful visit was to ATC Perth Radar, at Kalumunda.

A Christmas Barbecue was held at Yanchep National Park, 50km north of Perth, on 1st December 1985. An oval was booked for this enjoyable event.

The club has a permanent shack in the college and after careful negotiations, a 15m (50ft) mast has been acquired. A task force is presently devising a platform, outriggers, and an antenna rail system for the mast. It should be completed and operational by this time.

Erecting the Delta antenna for the RD Contest.

The club station call sign, VK6ANC, has been *aired* frequently with the group's participation in contests and during JOTA. The activity in the Remembrance Day Contest was a day-to-remember. It was an excellent weekend, setting up antennas, sorting out the shack, and best of all, *operating*. The shack was a hive of activity and the club gained a fairly respectable score on both HF and VHF.

Testing the antennas in the shack are (from left): Nick VK6AFK, Rob VK6ZRE and Imar.

Rob VK6ZRE, Wesley and Steven do their share of operating during the contest.

The club call sign was portable for JOTA during a memorable weekend with Cubs, Scouts, Brownies and Guides at Sorrento, near the ocean. Propagation was bad but it didn't dampen the excitement for the young people.

During the CQ World-Wide DX Contest, the group was again active. Although bad propagation and indifferent antenna performances were experienced, many countries were worked during an enjoyable weekend.

With the erection of our mast and proposed monobanders, the group will certainly become a force to be reckoned with during the coming international contests.

Compiled by Nick Morgan-Hobbs VK6AFK with photographs by Phil Hartwell VK6ABL

AR

CENTRAL COAST FIELD DAY

The Central Coast ARC will be holding it's 29th Field Day on the 23rd of this month. The Field Day is very labour intensive, so help is needed.

AR

VK3RTY IS THE HEART OF MELBOURNE RTTY

The idea of having a RTTY repeater can be traced back about six years when a group of people, interested in teletype, began work on the project. For various reasons, and despite some considerable effort put in by the group, the project dragged on and became somewhat of an embarrassment to the Eastern and District Radio Club (EMDRC).

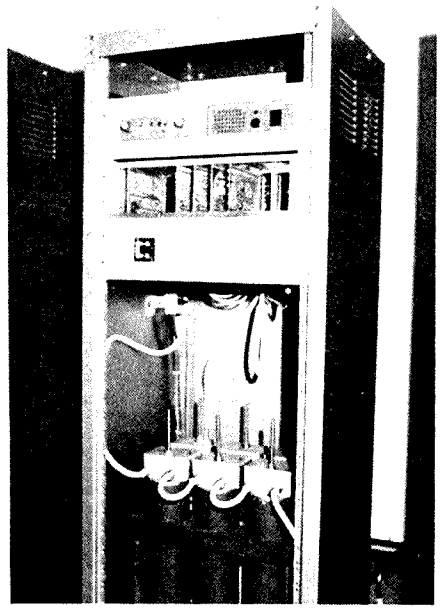
In late 1982, the issue of VK3RTY was raised at an EMDRC committee meeting, and committee member, Ken Palliser VK3GJ, volunteered to take over the project.

The first thing Ken decided to do was use all microprocessor control, instead of the hard-wired logic system which was tried by the initial group. A solid-state transceiver was obtained and shielded to make it compatible with micro-control.

Ken re-designed the repeater control system and virtually the only part used from the earlier attempt was a metal housing box. He had a concept in mind on how the repeater should be micro-controlled and worked steadily to achieve success with an up and running VK3RTY, in November 1982.

During its trial period at Ken's home in Mitcham, an eastern suburb of Melbourne, it was accessed by stations from throughout the metropolitan area.

After a shake-down phase, VK3RTY was installed the following February on Mount Dandenong. It opened a new era on the RTTY

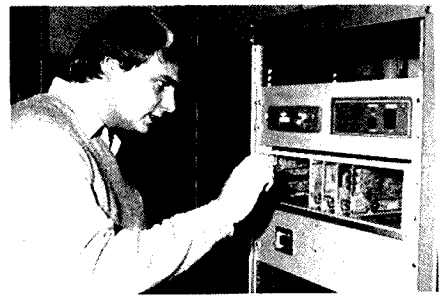


The VK3RTY Repeater situated on Mount Dandenong.

scene and gave users of this mode freedom from being confined to simplex working on 146.600MHz. Users are in the greater Melbourne area, Geelong district and further away from Mount Dandenong (including Morwell, in the LaTrobe Valley) using beam antennas.

VK3RTY was the first Australian repeater to have stored messages, which can be retrieved by anyone able to access it using Baudot code.

Many stations enjoy accessing the repeater for print-outs of the stored information which is regularly updated remotely, by Ken, using high speed data. They call up a menu which tells them what information is available, and the access codes needed to retrieve the messages. These pages are widely read and certainly keep RTTYers, and listeners, informed on local activities and news.



Ken Palliser VK3GJ, adjusts the VK3RTY equipment.

Available from the repeater, on command, are RY8s, Mark and Space Tones, Echo Test, and The Quick Brown Fox. These have helped, many to get their modem working efficiently and adjust their printers.

Those who initially cannot get into VK3RTY often ask a friend to activate the tests for them. Usually, soon after such an exercise, a new RTTYer is born.

In the long term, VK3RTY will have a Mail Box facility to enable users to leave messages addressed to others for later retrieval. Ken VK3GJ, has begun early work for this enhancement which will add a new dimension to the RTTY scene.

As technology develops, the man behind VK3RTY is certain to introduce further refinements in the future.

For his tremendous contribution to RTTY activity through VK3RTY, Ken was recognised by the WIA Victorian Division, in 1983, when he was awarded the Gadsen Trophy for Technical Achievement.

Contributed by Jim Linton VK3PC

AR

CLAIRVIEW RADIO CONVENTION

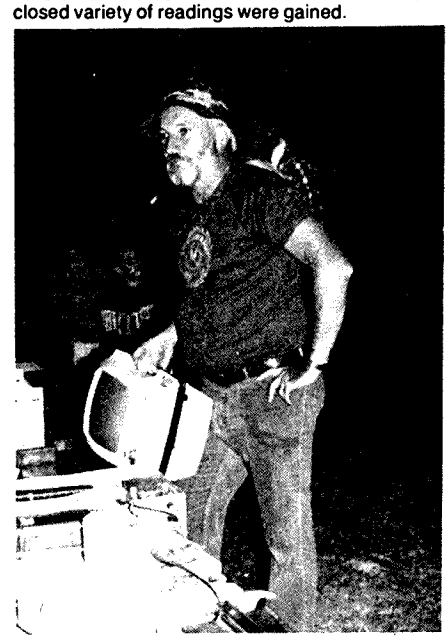
The Clairview Radio Convention, held on 9th and 10th November 1985, at the Golden Mermaid Caravan Resort, 210km north of Rockhampton, and was well-attended (53 attendees) for the second year in succession.

Amateurs, and their families, came from Hughenden, Emerald, Rockhampton, Mackay, Yeppoon, and Wynuum, near Brisbane. Max VK4BMW, and his wife Gwen VK4VDE, extended their holiday to coincide with the Convention, whilst Jack VK4VAS, and Alma VK4VAR heard about the Convention and stayed at Clairview so they could attend.

The beach-front and caravan park provided an excellent location for Fox-hunts, which proved to be a popular activity for all attending. Ron VK4EN, and Robb VK4TKA, constructed a two metre Fox with a 50mW transmitter housed in a black di-cast box for the event.

An unusual array of sniffer antennas and devices emerged from car boots, with some working better than others, of course.

During the day, Trevor VK4ZTV, tested all two metre gear with a digital frequency counter and a prize was given to the owner whose rig was calibrated nearest to 146.500MHz. An undisclosed variety of readings were gained.



Robb VK4TKA, the determined auctioneer.

An enthusiastic audience awaiting their opportunity to buy at the auction.

On Saturday night, an auction of excess radio equipment was held, with Robb VK4TKA acting as a popular auctioneer. Black and white televisions were sold for $3, computers $13.50, packets of

From left: Jan VK4NTP, Ken VK4JPE and Brian VK4QB.

Trevor VK4ZTV inspects a 'treasure'.

assorted crystals $3, and radio bits and pieces were sold from $1 to $25. Everybody took something home and the proceeds were divided between the Central Queensland WIA, and the Mackay Amateur Radio Club.

Thanks to all who attended to make this event such a success.

It is envisaged to hold 'Clairview 86' later this year, and anyone interested is welcome to attend, a good time is assured. It would be lovely to see some interstate visitors this year, so time your visit to Queensland to coincide with the Convention.

Contributed by Nick Quigley VK4NFL

AR

Lyle VK4ALD (left) and Ted VK4QI — it would have to be in that direction.

Wally VK4AIM (left) and Max VK4BMW, check the lots prior to the auction.

From left: Graham VK4NFZ, Roger VK4MKY, Robb VK4TKA and Marilyn VK4MPY.

Ken VK4JPE — now which way is that fox?

Some weird and wonderful devices were used to detect the fox!

LEFT: The Intrepid Fox-Hunters — from left: Ted VK4QI, Roger VK4MKY, Robb VK4TKA, Ron VK4EN, John VK4JMA (and canine friend), Jack VK4VAS, Brian VK4QB, Alma VK4VAR, Phil VK4TPK, Max VK4BMW, Lloyd VK4ALW, and Lyle VK4ALD.
Seated:Ken VK4JPE and Wally VK4AIV.

The 'L-shaped Hand-Held Antenna'.

WAGGA CONVENTION

The weekend of 26-27th October 1985 was the chosen weekend to hold the much awaited Wagga Convention, with the host for the weekend being the Wagga Amateur Radio Club.

It was decided to avoid the traditional New South Wales Holiday Weekend at the beginning of the month and to opt for the 26th and 27tn instead. This proved to be a wise move, as it did encourage family groups to make the visit without the traffic hassles and other commitments associated with holiday weekends.

Between 150 and 200 visitors were treated to activities involving a full weekend which really started on the Friday night and went well into the Sunday afternoon. This then gave visitors a chance to get home at a reasonable hour.

The organisers were indeed fortunate to be blessed with almost perfect weather, which followed a week, or more of cold stormy conditions.

Visitors began arriving in Wagga on the Thursday and Friday and by the official start of registrations on Saturday, the Convention site, at Camp Kurrajong, was a height of visitor activity.

Tony VK2ACV checks his CW speed amid the vintage radio display.

Stan VK3BSR, from Bail Electronics, with Jack VK2AY.

There was good support from the major amateur trade suppliers and visitors were able to observe some very interesting demonstrations, including amateur fast scan television, demonstrated by Peter VK2DOL and Graham VK2HI, and a slow scan demonstration by Stan VK3TE. A very interesting demonstration was the various facets of amateur astronomy and a model of the AUSSAT satellite was included.

Some RTTY, working vintage engine display by Alan VK2KAW, World War Two and vintage radio and telegraph displays were also popular.

As with most conventions, contests are the backbone of any such event. As well as the normal run of two metre and HF events which were organised by the Wagga Club, there was the added attraction of the finals of the National Two Metre Foxhunting Championship, which was run concurrently.

At the lunchtime break, visitors were treated to a top quality barbecue on both days. The Official Convention Dinner was held at the Riverina Australian Football Club and again there was a capacity attendance on Saturday night.

Speeches were kept to a minimum to enable a maximum of socialising and after the main meal, a trivia night concluded the evening.

Stan VK3TE demonstrated slow-scan television for the visitors.

The working vintage engine display by Alan VK2KAW.

Peter VK2DOL erecting the ATV antenna at the Convention site.

Enjoying the barbecue (from left) Harry VK2AEC, John VK2TH, Jeff VK2KBK and John VK2KAO.

Some happy guests at the Convention Dinner.

Happy Hunters (from left) Phil VK1YS, Dave VK2ZYE, Doug VK2ZMP and Sid VK2SW.

The winning QSL Card.

Following the immense success of the Convention, it was decided by the Club, to hold it again at the same place, same time this year, so if you are looking for a weekend in the south west, start planning now to keep that weekend in October free for Wagga '86.

Prize winners for the weekend were —

2m hidden transmitter hunts on Saturday were won by Jeff Pages VK2BYY, Roy Stockman VK1KRS, and E Templeton VK3BMV.

The 2m hunts on Sunday were won by Geoff Hudson VK3CGH, Henk DeJong VK3BLI, Peter Clemson.

David Thompson VK2BDT was first in the All Band Scramble with John Lacey VK2YEZ second.

The Ladies Throw was won by Francis Nugent and Louise Wheaton.

The person who travelled the greatest distance was Bill Sebbens VK4XZ and the Best QSL Card belonged to Jeff Lange VK2EJJ.

Overall winners for the weekend were — Champion: Jeff Pages VK2BYY; Second: E Templeton VK3BMV; Third: Henk DeJong VK3BLI.

Script — Sid Ward VK2SW. Photographs — Jeff Lange VK2EJJ

AR

SE QUEENSLAND TELETYPE GROUP

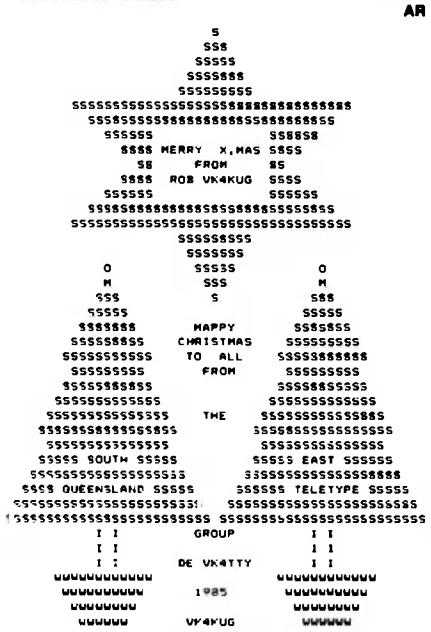
The printed printout is a RTTY Christmas message which was transmitted on the South East Queensland Teletype Group's VHF RTTY Repeater, VK4RBT, which is located at Mount Cotton, south-east of Brisbane city.

The picture was compiled and transmitted up to, and including, Christmas Day by VK4TTY News Co-ordinator and Station Manager, Ron VK4KUG.

The SEQTG RTTY News Service commenced for 1986 on 27th January. Frequencies are 3.630, 7.045, 147.650 and Vision Repeater VK4RTV UHF-ATV channel 34 at 1000UTC.

Phone call-backs are conducted on the above frequencies immediately after the RTTY News Broadcast concludes.

AR



TASMANIAN AMATEUR RADIO CONVENTION 1986 (TARC 86)

The WIA Tasmanian Division, Northern Branch, will hold a Radio Convention on the weekend 15-16th March 1986, at the Australian Maritime College, Newnham Campus, Launceston, Tasmania.

Activities over the weekend will include the Tasmanian Annual General Meeting, Annual Dinner, Displays of RTTY, Satellite, HF, VHF, UHF and Video Equipment, Film and demonstrations. There is also local sightseeing and good accommodation and meals are available on site.

Further information may be obtained from Rick VK7ZZ, phone (003) 31 9902 or Leon VK7NHG, phone (003) 44 7858 or write to PO Box 275, Launceston, Tas. 7250.

Contributed by Loon Horbig VK7NHG
Publicity Officer TARC Committee

AR

SOUTH AUSTRALIAN AMATEUR ACTIVITIES FOR JUBILEE 150

January — December 1986 ... Worldwide J150 Award Contest

25th January — 2nd February ... Port Willoughby Lighthouse Special Award to promote Kangaroo Island, J150 and SA.

28th February (?) ... LEPARC Re-enactment of Matthew Flinders Landing at Port Lincoln.

5th March ... Victor Harbour Horse Drawn Tram Activity.

8th March ... Halley's Comet with Amateur radio Communications.

25th May — 1st June ... Friendship Exchanges Between South Australia and Texas Twin Town, DC, via Amateur Radio.

Queen's Birthday Weekend — June ... SERG Convention with J150 Input.

Labour Day Weekend — October ... LEPARC Hamfest, a weekend of Amateur Radio.

December ... SA Amateurs to Promote the Second Grand Prix.

Amateurs who would like to participate in these events, please volunteer your services to the WIA Jubilee 150 Co-ordinator, Graham Horlin-Smith VK5AQZ, Box 1234, Adelaide, SA. 5001. Further information may also be obtained from Graham or the SA Division of the WIA.

AR

WESTLAKES CONFERENCE

The 13th Conference of Clubs was held at the Westlakes Club on 8th December 1985, and, by fortuitous circumstances, 13 clubs were in attendance.

The representation put to rest the fears that a quorum would not be obtained and, as a result, the business paper and additional general business was all dealt with before the closing time.

The Conference was ably chaired by Eddie Jayne.

Eddie Jayne chaired the Conference whilst Richard VK2FJS writes the Minutes.

Delegate for Westlakes ARC, Dennis VK2XDW (left) and Mid South Coast representative Kevin VK2BKG, at the Conference of Clubs.

The Club was well represented by Dennis VK2XDW and Alan VK2CZZ, with VK2s ZTM, PJ, BYY and PS representing the Divisional Executive. Richard VK2FJS did a superb job of minute-keeping.

Attendees at the 13th Conference of Clubs.

NSW Divisional President, Peter VK2PJ, presents John VK2FDB, of Fishers Ghost ARC the Award for the biggest percentage increase in WIA membership for the past six months.

Much was accomplished at the Conference and it gave the ordinary member an opportunity to exercise his democratic rights.

Thanks to Beryl VK2DVL and Doug VK2AVO for providing morning tea.

From material supplied by Keith Howard VK2AKX.

AR

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

For forthcoming activities listen to the VK2WI Sunday Broadcasts for further details.

FIELD DAY

The *Central Coast Amateur Radio Club* will hold their Annual Field Day at the Gosford Showgrounds on Sunday, 23rd February 1986. There is plenty of off-street parking and several large covered areas for displays and exhibits. The event is not affected by weather conditions. Newcastle and Sydney trains are met. It is an ideal outing to see old friends and to browse through the trade exhibits.

CONFERENCE OF CLUBS

The next *Conference of Clubs* will be hosted by the Orange Amateur Radio Club and will be held in Sydney over the weekend of 19-20th April. The meeting will deal with both its own agenda items as well as consider the Federal Convention items. The Agenda closes in late February.

SEMINAR

The next *VK2 Seminar* will be held on Saturday, 8th March, at Amateur Radio House. This will also be the end of the Divisions celebration of the 75th Anniversary year and the closing off of the *Time Capsule.* If you would like to include your QSL card or similar, bring it along, or post it to the Divisional Office. The *Time Capsule* is to be opened on the 100th Anniversary of the Institute in March 2010.

ANNUAL GENERAL MEETING

On Saturday, 5th April 1986, the *Annual General Meeting* of the Division will be held. A separate posting of the notice of the meeting, agenda, and annual report will be sent to members in March. The AGM also means a new Council year and nominations are called to fill positions on the Council. Nomination forms are available from the Office. Agenda items and nominations are to reach the Divisional Office during early March.

SUBSCRIPTIONS DUE

Most members will have received their renewal notice during December. If you still have to attend to this matter please do so now to enable the continuity of Amateur radio magazine and your membership. The introduction of an in-house computer in the Federal Office has enabled the phasing-in of cyclic billing to those members who joined during 1985. Any member who joined during 1985 will receive their renewal a couple of months before the anniversary of joining. All other members who were members prior to 1985 are calculated as having joined on the 1st January. Your renewal date is included in the AR address label. For several years the Division has been able to maintain subscriptions at the present level. This is possible by maintaining (and increasing) a high level of membership.

FEDERAL COUNCILLOR

For some years, our Federal Councillor has been Steve Pall VK2PS. Steve has retired from this position as of the end of 1985. His place has been filled by Jeff Pages VK2BYY from 1st January. Alternate Federal Councillors are still Tim Mills VK2ZTM and Wally Watkins VK2DEW.

CALL BOOKS

A reminder that the current Call Book is available for $6.00 from the Divisional Office during office hours — Monday — Friday 11am — 2pm and Wednesday evening at 7pm. If you require a copy to be posted add $2.00 for postage and packaging. The Call Book is also available on Bankcard. Telephone (02) 689 2417 during the above times.

Club members check with your club, as several clubs are carry stocks of the Call Book.

UHF TELEVISION

It was announced in late December, that the Wollongong region is to change to a UHF only television service within three years. The existing channel 4 commercial will be phased out to enable the channel in the area to revert to FM broadcasting. Channel 5A (Wollongong would also disappear. All existing and future services will then be only on UHF The area already has UHF SBS.

BEACONS AND REPEATERS

The Division recently added 23cm to its beacon network at Dural, under the call sign VK2RSY — 1296.420MHz. A QSL card will be exchanged for all reports received. The beacon network will be expanded into the microwave region. The next planned frequency is on 10GHz.

VK2RCW, HADARC's Auto Morse Machine, is in the process of changing its two metre frequency to 144.950MHz; one of the channels in the band plan for this type of service. By the way, have you been making much use of the 80 metre outlet on 3.699MHz? Reports and comments are welcomed by HADARC at PO Box 362, Hornsby, NSW. 2077.

An application for a Packet repeater has been received from Coffs Harbour ARC. It is to be co-sited with their existing RCH 6650 service. Advice has been received that Packet Repeaters are planned for Port Macquarie and Lismore. Oxley Region ARC are to add a UHF voice service to their existing RPM 6700 outlet.

Investigations are continuing with two metre repeaters, particularly those in the top megahertz area, on how best to operate with the paging network which utilises the adjacent frequency allocation from 148MHz and up. Questionnaires where circulated to repeater groups late last year, to help identify the major problem areas.

AR

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW BEACON

A new beacon should now be operational with the call sign, VK3RCW.

This beacon is situated in the Waverley area of Melbourne and generates CW practice at both five and 10 WPM continuously for 24 hours-a-day. The code is in groups of five mixed alphabet and number characters which are computer generated. Those who wish to upgrade, or just to keep up your speed, listen on 144.950MHz FM.

CHECKS AVAILABLE

The Department of Communications has made available to VK3 amateurs a frequency and deviation check for two metre transmitters.

By contacting the DOC monitoring station at South Morang, and making the appropriate arrangements, you can have these checks done. Thank you DOC for making this service available.

QSL BUREAU

The Inwards QSL Bureau is getting a large backlog of cards awaiting collection. The reasons for non-collection of your QSL cards are many and various. Some of these reasons would appear to be a lapse of postal credit, change of address, or maybe just dis-interest.

Please assist the Bureau by either getting your address correctly notified and listed, ensuring you have sufficient postage credit so that your cards can be mailed to you, or if you are not interested in QSLing, then tell the other station you do not wish to QSL.

Whilst on the subject of QSL cards, it is essential to ensure your cards are of the correct dimensions. The size 140 x 90mm is the optimum for postage, as it makes the parcel easier to wrap and is in line with the International preferred size.

Cards bigger than this size will be damaged by folding. To further assist the Bureau, the recipients call sign should be at the top right hand side and cards sorted alphabetically.

Your co-operation with these requests will not only assist you, but will also help to ease the workload of the volunteers who sort your cards at your free QSL Bureau.

Contributed by Bill Wilson VK3DXE

AR

WARM WELCOME EXTENDED

The VK3 Division of the WIA would like to extend a warm welcome to the following new members.

Ian Ampt VK3CH; Willem Beyer VK3BHW; John Cameron; Gordon Cornell; William Costello VK3DWC; Graeme Davidson VK3KQQ; Richard Djubek VK3DXO; Noel Funge VE4CF; Geoffrey Garde VK3CGT; Peter Haines ZL4LD; Dennis Heaton G3YSV; Keith Levens VK3PKL; Stuart McKenzie; Geoffrey O'Hoy VK3NGO; D Olley 3D2DW; J O'Rorke VK3XS; Gregory Rice VK3VRU; Mrs J Rice VK3VKU; Doug Rolfe VK3XKG and Elizabeth McLachlan.

Congratulations on your membership and welcome to the Institute.

AR

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

This months notes centre around photographs taken by Bud Pounsett VK4QY, during the Commemoration of the first television transmissions in Queensland.

The South East Queensland Amateur Television Group honoured the memory of television pioneer, Tom Elliot, who in 1935, transmitted television pictures from Brisbane's Tower Mill to Ipswich.

Amateurs and friends gathered at the site on the morning of 6th October 1985, and after a brief ceremony, proceeded to the historical Society Building in William Street. There they viewed the original equipment used by Tom.

AR

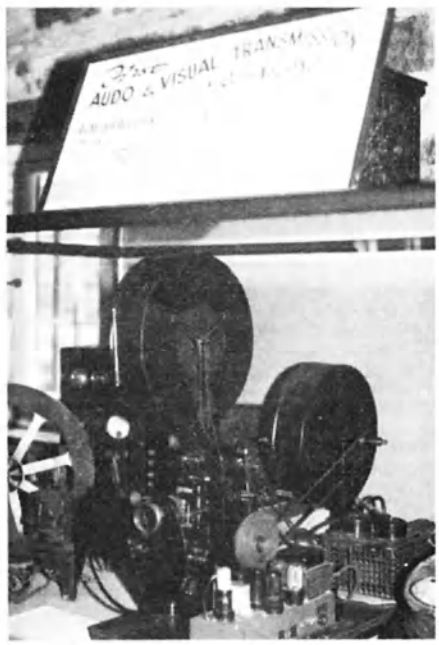
Tom VK4ABA, ably compered the proceedings, watched by cameras from all Brisbane channels, who recorded the event.

Above:
Mr Campbell, a colleague of Tom Elliot, recalled the man and his work for an appreciative audience.

Ann VK4KZX and Guy VK4ZXZ, dressed for the occasion in the dress of the day.

John Aarsse VK4QA, spoke on behalf of the Queensland Division.

Eddie White VK4OW, and part of the group at the Tower Mill.



Part of Tom Elliot's original equipment on display in Brisbane's Historical Society Building.

Did you know?
On 19th February 1878, Thomas Edison patented the phonograph.

WA Bulletin

The final meeting of the year has come and gone, and as usual the December meeting took the form of a Christmas Party. This was held, as it was the previous year, in the restaurant area of the Westrail Centre, in East Perth.

Following complaints from country groups that holding the party on a Tuesday evening — the normal meeting night, made it impossible for country members to attend, we broke with tradition and held the party on a Saturday. We booked for 120 people, which has been the average attendance over the last five years and sold tickets at the cost price of $10 per person.

It soon became evident that Saturday was not a very convenient night for some due to other parties, previous engagements, and, in some cases, baby-sitting chores. Arrangements were made with Westrail to reduce the booking to 100 people and although ticket sales were slow, it was hoped to make up the numbers at the door. This never happened and total attendance was 76, including two members from the outer metropolitan area and just one from a country group.

WHAT IS THE ANSWER?

This means that, for the first time, the Christmas party was run at a loss. One wonders what the solution is? On request, we hold the party on a Saturday to enable country members to attend and as shown, we do not get any support. It is certainly something for the 1986 Council to think about.

The party itself was excellent with the catering being first class. Guests of Honour were the State Manager of the Licensing Department of the Department of Communications, Mr Barry Field and Mrs Field, and the Western Australian Manager of Dick Smith Electronics and his guest.

PRESENTATIONS

During the evening, several presentations were made commencing with the winners of the WA 80 metre SSB and CW Contests.

Following this the annual presentation of the Amateur of the Year Award and Certificates of Merit were made. The holders for 1985 are:

AMATEUR OF THE YEAR —

Fred Hull VK6FH, for his work over the years in promoting RTTY, digital techniques, packet radio, and helping many people in all aspects of the hobby.

OUTSTANDING SERVICE TO AMATEUR RADIO CERTIFICATES

Don Reimann VK6DY, for many years service to WICEN.
Will McGhie VK6UU, for work on repeaters and other techniques to improve the news service.

1985, being the 75th Anniversary of the WIA, the Division was allocated 24 medallions for presentation to commemorate the year. These were made as follows:

North West Radio Society, Amateur Radio Instructors — accepted by Dave Couch VK6WT, on behalf of those involved.
WICEN.
Geraldton Amateur Radio Group.
Goldfields Amateur Radio Group.
Southern Electronics Group.
VHF Group.
Repeater Group.
Wireless Hill Museum.
AARTG.
Old Timers Group.
YL Luncheon Group.
Northern Corridors Group, which was formed in 75th year.
Midland Amateur Radio Society, which was formed in 75th year.
South West Amateur Radio Group, which was formed in 75th year.
Peel Amateur Radio Group.
Perth Radio League.
Dave Wallace VK6IW, council in 75th year.
Christine Bastin VK6ZLZ, council in 75th year.
Cliff Bastin VK6LZ, council in 75th year.
Cyril Rice VK6MY, council in 75th year.
Alyn Maschette VK6KWN, council in 75th year.
Jill Weaver VK6YL, council in 75th year.
Douglas Gordon VK6ZMG, council in 75th year.

Medallions had already been presented to Neil Penfold VK6NE and Bruce Hedland-Thomas VK6OO, by the Federal Body as being Federal Councillors.

In allocating certificates or medallions, the Council is presented with an unenviable task. There are so many who give their time in contests, news relays, scouting, instruction, and so many other aspects of the hobby that the list would and should be endless. Ours and all members thanks are freely given and may you all get out of the hobby as much enjoyment as you give.

Finally, a big thank you to Christine VK6ZLZ, long suffering wife of VK6LZ, who put in 99 percent of the work and organisation of the Christmas Party — we support you Christina.

AR

Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT. 2606

1986 ANNUAL GENERAL MEETING

The 1986 Annual General Meeting of the VK1 Division will be held at 8pm on Monday, 24th February, in the Griffin Centre, Civic. There is still time if you wish to nominate for a position on the Committee. Contact Alan Hawes, the Public Officer, if you believe you could serve the Division in this way.

At the AGM, there will also be discussion on some minor technical changes to the VK1 Division Constitution, to take account of Cyclic Billing. Whether an amendment motion will be put is not known at this time, so keep listening to the Sunday evening Broadcasts for up-to-date information.

FOX HUNTING — VK1 STYLE

On the morning of Sunday, 24th November 1985, the gentle peace of a Canberra weekend was shattered as hordes of wild amateurs met to track the elusive VK1 Fox. Dennis VK1DG, was the Fox, with seven teams of amateurs souring Canberra suburbia for glory, honour, and that little black box. The victors were Roy VK1KRS and Richard VK1KAB. They were closely followed by Peter VK1DS and Tom VK1BUD.

All had an excellent time, thanks to Dennis VK1DG and Dick VK1ZAH. The last word on the subject must go however to Oscar Wilde — *"One knows so well the popular idea of health. The English country gentleman galloping after a fox — the unspeakable in full pursuit of the uneatable".*

FIELD DAY CONTEST

The Division's John Moyle Contest Station will be located at Bulls Head, in the Brindabella Ranges. If you would like to participate, contact Alan VK1KAL, or any of the Committee.

AR

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

I have received a complaint (so what else is new?) from Ken Westerman VK5AGW, that I failed to mention what a great time the Alice Springs Radio Club gave him and his wife Jann, when they were at Alice Springs during the latter part of 1985.

They have been having problems with the Alice Springs repeater, which is being interfered with by the Emergency Services vehicles at the airport, which is where the repeater is located. Last time I had communication with the Club, they were about to contact DOC regarding a change in frequency for the repeater. They are also hoping to put up a couple of beacons very soon.

REGRETFULLY ACCEPTED

Towards the end of 1985, we regretfully accepted the resignation of Jack Coulter VK5JK as Divisional Historian, due to ill-health. Jack's position has been filled by his long-time friend, Ray Bennett VK5RM. Ray has been a teacher for part of his life, and one of his subject was — you guessed it — *history.* To Jack, for what he has done over the past few years, and to Ray for accepting the position, we say thanks.

OFF TO THE FAIR

This year, for the first time, we participated in the South Australian Hobby Fair. This proved to be a most enjoyable event with lots of help from the organisers, parking in the showgrounds and plenty of interested spectators. Next year, I gather that the ATV Group and the Southern Cross DX Club would like to see us all under the one banner, so to speak. It sounds like a good idea to me.

I enjoyed myself on the Saturday night on Amateur Television, my first on-air experience, and once I had got over the initial self-consciousness, they probably wondered if they would ever get rid of me. Thanks fellas, it was great.

My thanks must also go to those who assisted with the WIA display. Peter Koen, Lindsay VK5GZ, Jack VK5FV, Bert VK5AOL, Cyril VK5KEM, Ron VK5AAC, Max VK5NMX, Steve VK5AIM, and anyone else that I may have forgotten.

PROBLEMS WITH CHRISTMAS

Although I have been told by a few people how much they enjoyed our Christmas meeting this year, there were a few grumbles. The hall, and in particular the kitchen, left a lot to be desired. This was partly my fault as I had not checked it out, believing that it would naturally be of a similar standard to the one next door. My apologies to Wendy Clegg and the ladies and our thanks that the poor conditions certainly weren't reflected in the supper they served.

The lack of an amplifying system for the speaker and myself, was also a lack of checking on my part. My apologies to those who rated us only a readability 3, strength 2! I

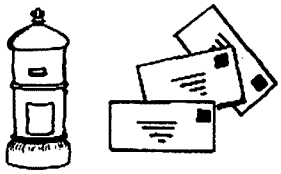
DIARY DATES

Tuesday, 25th February 1986 — General Meeting.

AR

WANTED KNOWN — CAN YOU HELP ?

The where-abouts of the family of the late Leo G Cohen, Telegrapher and maker of the Simplex Auto Bug. I am researching the history of Cohens Bugs, when they were made, where they were made, and the character of Leo, himself. Any information, no matter how minor would be appreciated. Contact Maurie VK3CWB. Phone (050) 22 2120 reverse charges, or write PO Box 2742, Mildura, Vic. 3500. *Old Timers, your help is needed! ! !*



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

COMMERCIALISM

When I read of the proposed operation of VK9LC in December's AMATEUR RADIO, page 42, I felt that there must be some mistake — such blatant abuse was unbelievable.

Subsequently, I found out that there was no mistake — I received a note asking for payment for the QSL card.

Cards obtained under such circumstances should be worthless for any award. No award that allows such abuse can be of any value.

The WAS and WAVKCA (VHF) Awards represent significant achievements, they must not sink into the mire.

73,

Gil Sones VK3AUI,
30 Moore Street,
Box Hill South, Vic. 3128.
AR

AMATEUR LANGUAGE

Referring to Jim Linton's letter in December's AR, entitled "Help Save the Amateur Radio Language".

"Amateur Radio Language" is the language of people having fun pretending to be members of an exclusive group. CB is a language of another community of amateurs and when there is a migration between the two communities each language will adopt parts of the other.

The only way to "stop the rot" is to actively oppose bad operating and the use of esoteric language. A good R/T operator is a joy to listen to and the distinguishing characteristic is the almost exclusive use of plain language. A good R/T operator would not use telegraph abbreviations and codes, and would know the correct meaning of QRT and QRX? A good telegraph operator would not use QRX or QRT as a request to 'wait' or 'standby'. (See the AOH, paras 8.7 to 8.9).

Lindsay Lawless VK3ANJ,
Box 112,
Lakes Entrance, Vic. 3909.
AR

NET HF FREQUENCY FOR VHF LIAISON

In reference to November 1985 AR and in reply top Charlie Gnaccarini VK3BRZ, regarding an HF calling frequency. I basically agree with the statements made but I wish to let the membership know that 14.103MHz and 7.055MHz +/- QRM have been used for VHF/UHF liaison for some time now. However, combined licences for limited and novice operators need to liaise also so may I suggest 3.580MHz +/- QRM as a crystal for this frequency is cheaply available from VK2DIK.

With this frequency and AM or LSB nobody will be excluded as a simple home-brew transmitter will do the job.

I hope this will be of assistance to the readership. The net is on Saturdays, 0330UTC on the 14 and 7MHz frequencies.

Yours sincerely,

Micha Lohse VK4JHM,
PO Box 849,
Atherton, Old. 4883.
AR

THANKS TO THE PRESIDENT

The 75th Anniversary Celebration of the Wireless Institute of Australia was a grand affair, and I am proud to have played a small part in your activities. You have a rare distinction, being the world's oldest amateur radio society. Furthermore, you have the distinction of wielding a great influence on the course of international amateur radio. As I tried to point out in my brief remarks at the Anniversary Banquet, *people* make the difference in any organisation, and it is clear to see that the WIA has been blessed with some outstanding people.

I congratulate you and all of your associates who were responsible for the calibre of the Anniversary — it was outstanding.

Thank you for the courtesies extended to my wife and myself during our visit to Melbourne and Australia. We enjoyed every minute of our stay, and only wish that we could have taken more time to travel about. We thoroughly enjoyed the scenic tours, and only hope that we can get another opportunity in our lifetime to a repeat through some other scenic portion of Australia.

73,

Sincerely yours,

Richard L Baldwin W1RU,
President,
The International Amateur Radio Union,
Maine, USA.
AR

THANKS FROM GIRL GUIDES

On behalf of the girl Guides Association of Australia, I would like to sincerely thank members of the Wireless Institute of Australia for their untiring assistance given to the Guides and Scouts during the 28th Jamboree on the Air.

The fun and fellowship provided by the International event would not be possible without WIA members help and is gratefully appreciated by all of us.

Yours faithfully,

Mrs June Retallack,
Australian Guide JOTA Liaison,
224 The Strand,
Bedford, WA. 6052.
AR

LEPRECHAUNS

The footnote appended to my article quote: "Propagation via Reflections from Aircraft" elsewhere in this issue is correct in that I have not disproved the proposition that balls of hot air may enhance signal levels.

Similarly logical explanations for happenings attributed to Leprechauns will not disprove their existence either.

73,

Gordon McDonald VK2ZAB,
59 Widevlew Road,
Berowra Heights, NSW. 2082.
AR

YOUNG THOUGHTS ON AMATEUR RADIO

This is written in response to a large number of letters and articles in recent issues of Amateur Radio, about the future of our hobby, amateur radio.

At the end of the year in which the WIA celebrated 75 years of service to the amateur community, it seems appropriate that people are questioning how the WIA, and similar associations, can continue to serve amateur radio, and the future of amateur radio in general.

Considerable concern is, justifiably, being shown over the increasing average age of the amateur population. Some of the fault lies with the way the hobby is seen by the younger generations, and I think Lindsay Lawless summed up a major problem in this area with his letter (November AR). The hobby is advertised as too expensive, and the general aim of promotional matter seems graded to older readers.

From what I have gathered, I am one of the younger amateurs, being all of 18 years old. There are, I am sure, several others my age and also some younger. It seems, however, that we are the unusual ones. We are the ones with amateur parents, or a genuine interest in radio which brought amateur radio to our attention. I was lucky, I had a cousin with a CB who was studying for, and now has attained, his amateur licence. He interested me in CB and from there I started SWLing and graduated to amateur radio. I was particularly encouraged by Matthew Cullen VK3VRO, at that time a 12 year old, who I QSLed. With other encouragement, and driven by a now avid interest in the hobby, I obtained my Novice Licence in May 1985. If I had not been encouraged, particularly by young Matthew I would probably not be writing this today.

So, I was lucky. But what about the others who are not so fortunate and who were perhaps never introduced to SWLing? I still do not possess any amateur radio gear. I keep my interest in the hobby alive by SWLing on the shortwave bands using a four band radio-cassette recorder.

I think we need to promote the hobby to the younger generation and as Lindsay says — the best way to do that is through the young people.

Whenever I get the opportunity, I advertise the hobby, but more is required. Maybe something which can capitalise the habits of todays young.

We don't need a revised tradition, as suggested in the CQ editorial (reproduced in November AR) but we do need a unicorn but the tradition is fine. What we really need is a new image, a modern image — an image that does away with the idea that amateur radio is a restricted, exclusive club for old folks.

In the interest of making sure there is amateur radio around for the celebration of the WIA 100th anniversary, it is time to start encouraging the younger people to take an interest in the hobby. Those of us who are young now will not be sufficient to keep the WIA alive in the years to come, and when we are gone, who is going to advertise then? I doubt the there will ever be a stage in amateur radio when there are no young folk left, but I would like to see more at this present time, to ensure the continued growth of the hobby.

If my services can be put to use for any promotional, or other activity, I would be more than willing to 'chip in' and help, (provided it does not interfere with my studies), and I look forward to celebrating 25 years of being a licensed amateur when the WIA celebrates the grand 100th anniversary, and starts planning for the second 100.

Cheers, from a radio-less amateur,

Conrad Canterford VK3PHW,
26 Pyke Street,
Tatura, Vic. 3616.

Thanks for the offer, Conrad, but you are still expecting us older amateurs to tell you what to publicise, and this is where we need guidance from your generation. We look forward to more of your well-considered thoughts. — Ed.

AR

THE YOUNGER SET

I am one of the one percent of radio amateurs — those under the age of 20. I am at a school where there are no other people interested in amateur radio. However, there are many people interested in electronics (which is taught in the physics course), and many interested in computers. Amateur radio, as it appears, is not appealing to them, but data communication, mailbox, and program exchange is of interest.

I was very interested to read the Discussion Paper: Amateur Radio — Future Direction. I confirm the observations in this report in all respects. I fully support the recommended enhanced novice, intermediate and telephony licences.

I believe that this suggested system would encourage many young people to gain a licence. By careful allocation of frequencies, now unoccupied bands could be revitalised. One organisation has taken the initiative to supply easy-to-build kits for amateurs. These projects and similar are excellent starting projects and provide a cheap station. The recommended licenses have the possibility to do good things for our great hobby.

Sincerely,

Jonathan Marshall VK3PRN,
30 Somers Avenue,
Malvern, Vic. 3144.
AR

COMPUTER INTERFERENCE

Is there any possibility of an article by an expert on RFI in relation to computers and amateur radio? I refer to interference generated by the

computer and seek practical means of overcoming this problem written in fairly simple language for old timers to understand.

There does not seem to be much available on this subject.

73,

Tom Thorpe VK2QT,
Kelson Cottage,
Oxley Drive,
Mittagong, NSW. 2575.

This has been a serious problem in other countries and has been tackled in the USA by much more stringent FCC rules as to the allowable radiation levels which manufacturers must satisfy. We would welcome articles on how to improve computers which pre-date these rules, if it is economically possible. Ed.

AR

APPRECIATION

I would like to register my appreciation for the assistance given to me by Phil Birchdolt whilst doing the Novice Course 1984-65, which resulted in my obtaining my novice licence and the call sign VK3VJB.

Following this, I continued with the AOCP course instruction by Fred Swainston in 1985 and obtained my full call VK3CJT at the February examination. I finished the course in May and thoroughly enjoyed the experience. The revision weekends provided were excellent and I feel really lifted me to face the exams with confidence.

Since then, I have really enjoyed amateur radio and have found some wonderful friendships to make my retirement so much more enjoyable. I was an operator during WWII and have found many such fellows also enjoying this experience and, like myself, still hooked on pounding brass.

I look forward to many years of being on air just as I look forward to the beginning of each month and my copy of AR arriving.

Again, with sincere appreciation of the work of Phil and Fred put into stirring my 'grey-matter' to achieve the ultimate blue certificate and opening the way to making so many friendships at the classes and on air.

73.

Jack Barrett VK3CJT,
9 Charles Street,
Ascot Vale, Vic. 3032.

AR

TECHNICALLY SPEAKING — PEAK ENVELOPE POWER

Help! It seems to me, and to a number of fellow amateurs with whom I have discussed this subject, that there is an urgent need to clarify seemingly opposing views as to the method of arriving at this important measure.

The ARRL 1985 Handbook says, In reference to a non-specific composite waveform, see page 2-23, that to compute PEP, "multiply the PEV by .707 to obtain the RMS value, square the result and divide by the load resistance", that is:

$$PEP = \frac{(PEV) \times .707)^2}{R} = \frac{ERMS^2}{R} \quad R = 1.$$

but we know that

$$\frac{ERMS^2}{R} = \text{mean or average power.}$$

so this reference says that PEP = mean power.

On the other hand, the same Handbook says, in the context of a two-tone signal, see page 18-14, that:

$$PEP = 2 \times IRMS^2 \times R$$
$$= 2 \times \text{mean power} - 2.$$

The Amateur Operators Handbook by the then Postal and Telecommunication Department, agrees with this, see paragraph 5-43, page 19, where it states:

$$\text{Mean Power} = IRMS^2 R \text{ or } \frac{ERMS^2}{R}$$

and that PEP = 2 x mean power — 2.

As if that isn't enough, Mr N Cooper VK4ZNC, says in the context of a two-tone signal test, see AR for December 1977, page 39:

$$PEP = \text{two tone RMS power} \times (\pi/2)^2$$
$$= 2.467 \times \text{two tone RMS power} - 3.$$

(Note: There is strictly speaking, no such thing as "RMS" power. The correct name for power obtained from the product of RMS voltage and current, and variants involving R or Z, is "mean" or "average" power — see Alternating Currents, by A E Clayton, and ARRL 1985 Handbook, page 2-23).

The confusion caused, (to me, at least) by these apparently divergent views, is not clarified by various statements and definitions in the literature, all more or less supporting relationship — 1. above, viz:

From "Single Sideband for the Radio Amateur", ARRL, 5th Edition:

(a) "Peak Envelope Power Is the instantaneous power at the peak of the modulation cycle" page 251

(b) "Instantaneous or peak RF power is 2 times PEP" page 217

(c) "Peak Envelope Power is the average power (ie not instantaneous or peak power at all) of the highest amplitude signal measured over one RF cycle" page 217

(d) From the ARRL 1985 Handbook, page 2-23:
"The definition, peak power = peak volts x peak current = 2 x average power
conflicts with the meaning of the term when used in radio work, and peak power output of a radio transmitter is the power over the RF cycle having the greatest amplitude and

$$\frac{(PEV)^2}{2R}$$

(e) By David P Smythe, CQ February 1969 as reprinted in AR for August 1969, page 15:
"Peak Envelope Power is not simply peak voltage squared divided by the impedance as many amateurs believe"

These apparent inconsistencies came to light when preparing to calibrate a meter to read PEP, when it appeared that, depending on which approach was adopted a difference of 2 times (even 2.467 times) could result.

However, I suspect that all of these versions could probably be seen to be consistent if only the respective conditions were clearly understood, or at least specified, but they seldom seem to be. It seems to me that a minimum requirement is an easily understood, unambiguous, agreed definition of what is meant by Peak Envelope Power.

Would it be possible to have an authoritive article published in AR, bringing all these differences together, and defining in clear and unambiguous terms, with accompanying diagrammatic and mathematical support, Peak Envelope Power, and detailing how the radio amateur can measure it, in practice.

As a separate, but related issue, there must be many linear amplifiers in use by the VK amateur fraternity, designed to deliver power outputs well In excess of the legal limit in this country.

There appears to be a lack of information on how to properly adjust and operate these monsters, so as not to exceed that limit, and it is suggested that this also, would be a suitable subject for an article by an appropriately qualified member of our amateur fraternity.

I am sorry to be posing a series of questions, but no answers.

Yours faithfully,

Ken Andrews VK2ATK,
32 Aeolus Avenue,
Ryde, NSW. 2112.

Ron Cook VK3AFW, attempted to resolve the problem in Novice Notes for June 1981, entitled "Peak Envelope Power — What is it?" Some corrections were published in November 1981. They left the basic conclusions unaltered. PEP and mean power are the same for unmodulated CW. For two-tone and more complex modulation mean power is less than PEP The VK3AFW article answers most of the above questions. Ed

AR

On, or about 21st February 1858, the first electric burglar alarm was installed in Boston, USA.

Silent Keys

It is with deep regret we record the passing of —

MR G S 'ANDY' ANDERSON	VK2KGA
MR R H BAINES	L30009
MR HUGH CLAYTON	VK4AHC
12TH DECEMBER 1985	
MR D P DAVENPORT	VK3AWA
4TH OCTOBER 1985	
MR HARRY ELLSON	VK3DRO
19TH DECEMBER 1985	
MR WILLIAM LINDSAY GRIMSHAW	VK2EWG
23RD FEBRUARY 1985	
MR R F HARRINGTON	L50070
29TH JUNE 1985	
MR A V MACEY	VK3BYB
MR P A MCARTHUR	VK2DCS
MR H W MCKAY	L30034
MR T J MEAD	VK2EJM
MR A E 'ROBBIE' ROBERTSON	VK2US
9TH SEPTEMBER 1985	
MR J P ROSEWARNE	VK5MN
27TH JULY 1985	
MR E M SIMPSON	VK2ES
21ST JUNE 1985	
MR E V SPAILE	VK2YDS
13TH JULY 1985	
MR KEVIN JOHN WATSON	VK2BLW
29TH NOVEMBER 1985	
MR H A WHITE	VK3AGK
1ST NOVEMBER 1985	

Obituaries

HUGH CLAYTON VK4AHC

Hugh passed away at his home on 12th November 1985.

He was licensed in 1948 with the call sign VK4HE. At that time he was residing in Bundaberg, Qld. He spent most of his operating time on six and 10 metres.

I first met Hugh in 1938, when we were both employed as radio mechanics for the same firm in Bundaberg.

Hugh was an Englishman, amd worked on the land when he first arrived in Australia. He served in the last war and was a Sergeant. I lost touch with him during the early part of the war but caught up with him again around 1943, when we were in the same unit.

He was a perfectionist, his gear was always immaculate and looked very professional. He was Chief Engineer at 4BU prior to his retirement in 1972.

Apart from his very professional approach to radio, not too many knew that he was also a very competent pianist and organist. His knowledge and experience will be a great loss to amateur radio.

Deepest sympathy is extended to his wife and family.

Claud Singleton VK4UX
AR

A E "ROBBIE" ROBERTSON VK2US

A E "Robbie" Robertson was born in Liverpool, England, on 16th July 1908. He attended radio classes at the Marconi School of Wireless and graduated in 1924 with his radio operators licence. He became a radio officer with the Blue Funnel Line shipping company.

In 1931, Robbie migrated to Australia, gaining employment with AWA in 1932 as a radio operator on ships in the Australian Coastal Service. He was married in 1936 and, while still living in Melbourne, became an amateur operator in 1938. He was transferred with promotion to Sydney in 1941.

During the war years, Robbie became a ground radio maintenance engineer with QANTAS. He also flew as a radio operator on QANTAS aircraft (Flying Boats, Lancastrians, etc) in those years.

As QANTAS began to plan for new equipment, Robbie was appointed Radio Projects Engineer. He became responsible for the selection and introduction into service of many types of electrical equipment in L-749 Constellation, L-1049 Super Constellation, B-707 and B-747 aircraft. These responsibilities involved trips to USA and Great Britain for courses and conferences.

Among the many interesting developments were tests carried out in 1967 using Boeing 707 aircraft, in which satellites were used to relay signals from aircraft on the Trans-Pacific route. During the satellite program, VHF contact was made from the aircraft sitting on the tarmac at Mascot Airport to Seattle, via satellite. The satellite was 8 degrees above the horizon at Mascot at the time.

At 61 years of age, Robbie retired from QANTAS, and went back to radio school to get his Marine Operators Certificates revalidated, then returned to coastal shipping, until he retired again in 1972.

Robbie died on 9th September 1985 at the age of 77.

AR

KEVIN JOHN WATSON VK2BLW

When a man sets out with a vision, little can stop him in his pursuit.

Kevin John Watson VK2BLW, was one such man.

His sudden death on 29th November 1985, closed a chapter in the amateur radio history of the Hunter Valley, for which all can be justly proud.

Born in 1924 at Maitland, Kevin lived all his life in the area except for the time he spent in the service of his country during the Second World War when he was stationed in New Britian and the islands.

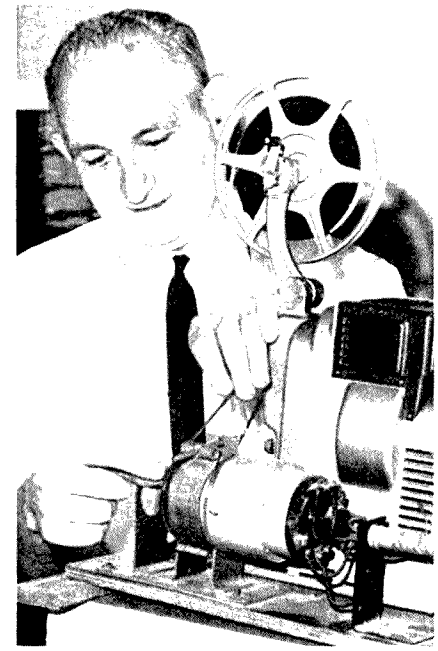
On his return in 1946, he began work with the PMG as a linesman. He quickly showed his ability, and before long was given the position of cable recorder, the first in the district. His continual search for, and achievement of skill, led him quickly to promotion. Soon he was with the indoor staff as a draughting officer. He held various grades of this position until his retirement from Telecom in April 1985.

Kevin married Margaret Holmes in 1948, a union which produced two sons, Gary and Allan, and three grandchildren.

Kevin's life could best be described as one of service and achievement — he was always ready to help out in time of need. This was obvious in his war service, but it was heightened in many ways by the natural disasters which beset the Maitland District.

When the fertile Maitland valley floods, much of the city is inundated. In the days before good communications were available, these times were disasters beyond belief. The flood of 1955 was probably the greatest the city has experienced and for seven days all road, rail, and most telephone links were severed. A disaster communications centre was set up at a high point in the CBC bank. Kevin was the message operator and for seven days and nights he remained at his post. During much of this time he was Maitland's only link with the outside world.

Always keenly interested in radio, Kevin became involved with the Maitland YMCA Radio Club in the halcyon days when the Youth Radio Scheme was drawing young people to the hobby. His aim though, was to make an independent club and he worked and guided the members towards this goal. In 1967, the dream came true and the Maitland Radio Club opened its extensive premises in Tenambit, on high ground above flood level. This was to be the communications base for Maitland and the training ground for young radio amateurs.



Kevin taken at the official opening of the Maitland Radio Club premises in 1967.
Photograph courtesy of THE MERCURY, Maitland.

Maitland Radio Club was one of the most progressive and dynamic organisations of its kind in Australia. As a direct result of Kevin's efforts, dozens of young people found satisfaction and enjoyment leading to a career in radio and electronics. Scores of others heard the hobby's message because of the hard work put in by VK2BLW. And his own family were not out of it by any means. Gary, now VK2ZKW, his father's first call sign, Allan and Margaret all became actively involved in Club activities. That both his sons are now secure in their own business enterprises shows the strong guiding hand of their father. His enthusiasm went far beyond making amateur radio just his own hobby.

But, this well-balanced man had other hobbies as well. One that he pursued with great enthusiasm was film making and amateur cinema. His house contained a well equipped cinema and he had a special ability to be able to make his own and others pictures live again on the screen by the use of his rare skills. Those who saw his shows, agreed that here was amateur cinema at its best.

Late in life, Kevin took up flying and he soon gained his pilot's licence, planning all the time for his retirement, so little of which he was to enjoy.

His devotion to his family and his many friends and associates came suddenly into focus at his funeral which was attended by well over 200 mourners.

The radio amateurs of the Hunter Region will long remember the great contribution made to our hobby by Kevin John Watson VK2BLW.

Written by Keith Howard VK2AKX from information researched by John Rogers VK2JRR.

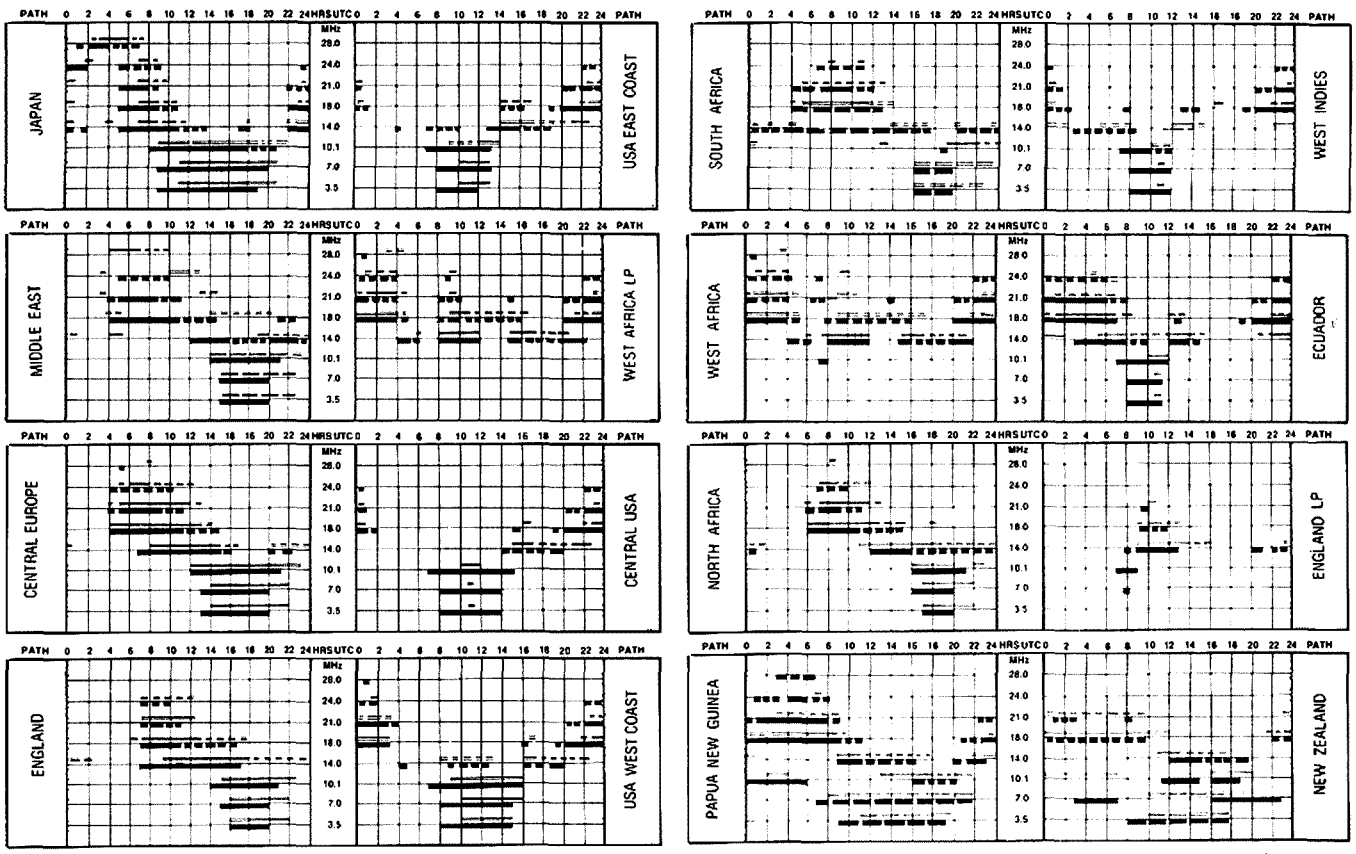
AR

THOUGHT FOR THE MONTH

When you argue with a fool —— two fools are arguing.

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND

From Western Australia (Perth)

From East Australia (Canberra)

Better than 50% of the month but not every day (continuous lines)

Less than 50% of the month (short broken lines)

Mixed Mode. Dependent on angle of radiation (long broken lines)

Paths unless otherwise indicated lie. LP = long path/ all paths are short path.

Predictions reproduced courtesy of the Department of Science and Technology, Ionospheric Prediction Service, Sydney.

All times in UTC.

BILL AND THE MORSE PRACTICE

Ted Holmes VK3DEH
20 Edmunds Street, Parkdale, Vic. 3195

Bill Blitheringtwit was sitting in his shack waiting for the front door bell to ring. On the desk in front ot him was a curious device connected up to a Prehistoric Morse key and he was idly playing with it, causing weird wailing noises to issue forth. Then there came a long loud ring. Bill got up and shambled to his front door. A grey haired man was standing there. This was Fred Nordling, a life-long friend.

"Hallo, Fred", said Bill, admitting him.

"Evening, Bill", replied Fred, walking in.

They both went to the back of the house where Bill's shack was. Fred was carrying a small box.

"You got it?" asked Bill.

"Yes", Fred replied.

Once in the shack, Fred opened his box and withdrew a Morse key and a small oscillator.

"You made yours?" Fred enquired.

Bill indicated his Morse key and its attachment. Fred looked at it in disbelief.

"Is that it?"

"Yes", said Bill. Fred examined it in disbelief. He pressed the Morse key and a strange wail could be heard.

"It works", Bill said. *"There's a bit of play on the key"*.

"Bit ot play!" Fred exclaimed. *"You could crack nuts with it! Where did you get the squeaker?"*

"Built it myself".

Fred said nothing. He had seen some of Bill's efforts before. At least this one couldn't do anybody any harm. Fred gave his key a couple of taps and looked at Bill.

"Ready?" he enquired. Bill nodded, whereupon Fred began to tap out Morse at what seemed to Bill a frightening speed. Fred saw that Bill was having trouble and stopped, saying nothing. Bill was going through the pretence that his pencil wouldn't write properly. He waited and then sent again. Once more Bill got nothing.

"You have a go", said Fred. Bill brightened up immediately and switched on the oscillator. He started hammering away at the key and produced a symphony of wailing reminiscent of air raid sirens, accompanied by a rhythmical sound like castanets. Then suddenly stopped.

"You get it?" he asked.

"You must be joking", Fred replied. *"Sounds like a cat's home in the throes of being machine-gunned. You'll have to do something about that oscillator."*

"I built it exactly the way I saw it in AR", Bill replied indignantly. Again Fred said nothing. He knew only too well that nothing Bill built ever followed the diagram. Things were changed, according to the junk available at the time.

"I've got a better idea", said Bill and disappeared out of the room. Fred waited, casting his eyes around the all too familiar shack. The place looked as though it had recently been visited by Whelan the Wrecker. Bill reappeared, carrying two cans and two glasses.

"A good drop, this", Bill remarked, holding up one of the cans, giving it a shake, then opening it and spraying Fred's oscillator with the contents.

AR

ADDENDUM

The winding details of the toroids were omitted from Figure 1 in the article "75 ohm High Pass Filter" which was published in January's AR.

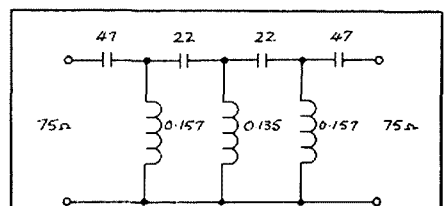


Figure 1.

Capacitance is in pF and Inductance is in μH.

0.157μH Inductance — 14 turns of 0.5mm enamelled wire on an Amidon T37.0 toroid.

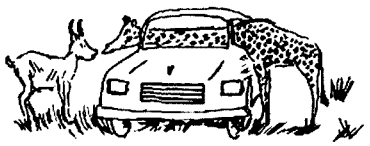
0.135μH Inductance — 12 turns of 0.5mm enamelled wire on an Amidon T37.0 toroid.

Capacitors are ceramic NPO 10 percent or better.

BATTERY DEVELOPMENT

Researchers at Murdoch University, in Western Australia, have developed a new type of electric cell. The key to the invention is an electrolyte for a zinc bromine cell. They are said to lightweight, cheap, and could produce twice the power of conventional lead acid cells.

NOTICE



DEADLINE

All copy for inclusion in the April 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st February 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 *of each issue.*

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x220mm SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. (No enquiries at office ... 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Rozelle, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

ICOM 720 or 730: or similar rig, in GC. VK2KTO. Ph: (067) 66 4437.

MEMORY MODULE (DMS UNIT: for Yaesu Model FT-107. Ph: (043) 24 7630.

YAESU FT-780R: 70cm all mode tcvr. Larry VK2EOY. Ph: (02) 949 3124.

WANTED — VIC

FRONT PANEL: Plastic trim (Plastic Escutchion) for the S meter and analogue freq read-out of a Yaesu FT-101 tcvr. Michael VK3CBY, 32 Sullivan Street, Springvale, Vic 3171. Ph: (03) 546 9219.

POWER SUPPLY: for Type 3 Mark 2 tcvr, or complete tcvr. 2m FM tcvr for mobile use. What offers? VK3OM. Ph: (03) 560 9215.

SOCKETS: Giant 7 pins to suit valve type 813. Garry Marcon VK3AJX, 2 Lowan Court, Frankston, Vic. 3199. Ph: (03) 789 4363.

SPEAKER: 5cm, 32 ohms, for Standard h-held tcvr, Model SR-C 146A. VK3AAP, QTHR. Ph: (055) 62 6016.

VALVES: 6CX8; 12AX7; 6DE7; ECH81; EFI83; ECC81 (2); EZ8; KT8. Bill VK3AJG, QTHR. Ph: (03) 783 5840.

YOUNG ENTHUSIAST: requires older type Morse code keys, bugs, telegraphic equip, etc, incl commercial, military, and amateur types. Working or not. Will pay a good fair price. Also require any literature that may accompany the keys. Maurie VK3CWB, PO Box 2742, Mildura, Vic. 3500. Ph: (050) 22 2120 reverse charges.

WANTED — OLD

OLD TYPE TX: such as Yaesu FT100, FL100B or KW series. Must be in good working order. N Richardson VK4BHJ, QTHR. Ph: (07) 354 3989.

WANTED — SA

MOSLEY TA-33 HF BEAM ANT: Any information at all as all information is urgently required. Send details to D A Sharp L50109, 142 East Terrace, Henley Beach, SA. 5022. Ph: (08) 356 8304 until 8pm. All correspondence answered.

YAESU FT-7B TCVR: with effective NB. Ray VK5AVR, QTHR. Ph: (087) 62 2034.

FOR SALE — NSW

ALDA 103: In good cond. $375 ONO. Ph: (067) 66 4437.

DATONG D70 MORSE TUTOR: with mini-earphones. Variable speeds & delays. As new. $70 posted anywhere in Aust. Tony VK2ECB. Ph: (049) 2 5932.

DX-302 COMMS RX: Mint cond, digi readout, h'book, & carton. Complete $270 ONO. Ken VK2PVK. Ph: (02) 644 7346.

HYGAIN 204BA MONOBAND YAGI: for 20m, in orig carton. Never used incl all hardware & instr book. $200. Ian VK2CJP, QTHR. Ph: (02) 44 4985.

MULTI 7: 1/10W, ch 1; 2; 3; 4; 6; 7; 8; 50; 51 with mobile cradle. $75. V5JR vert ant, 5 band. Near new, very good. $50. Denis VK2AOO, QTHR. Ph: (063) 62 5977.

Q METER: Model QMI, freq range 150kHz-18MHz, 240V. $75 ONO. VTVM Model V7, 0-1500V DC & AC, resistance to 1000Mohms, input R 11Mohms, 110V. $45 ONO. TV alignment generator, Model TS4A, 110V. $45 ONO. Philips VTVM Model GM6058, C/W all probes 0-1000V DC, 100mV-300V AC, AC & DC *current*, resistance *to* 1000Mohms. $85 ONO. Art VK2AS, QTHR. Ph: (02) 467 1784.

SWAN TB2A ANTENNA BEAM: ant rotator & mast. To be sold together. Ph: 871 7758.

TRANSVERTER: 28-430MHz Microwave modules, Model 432/285 — all modes, 10W. Hustler HF mob ant, 80-10m. Mast plus 5 resonators. Like new $100. Larry VK2EOY. Ph: (02) 949 3124.

VK2AXZ FOOD RECIPE COOK BOOK: with simple everyday ingredients. Collector's item, limited edition. Worthy cause (the continuous operation of a radio club). $2 incl post. Westlakes ARC, Box 1, Teralba, NSW. 2284.

YAESU FT-680R: all-mode 6m tcvr. VGC. $400 ONO. Neil VK2ZTL, QTHR. Ph: (02) 449 8690 BH only.

YAESU FRG-7700 RX: 12 mems, FRV, UHF *converter* type B-FRA, ACT, ant, -FRT ant tuner. New Cond, h'book. $500. Tony VK2EGH, QTHR. Ph: (02) 476 6108.

FOR SALE — VIC

MAGAZINES: Amateur Radio 1981-84 in GC. $10. Tech Te-15 GDO, 440kHz-280MHz. $30. JVC service manuals for GZ-S3 camera, HR-C3 recorder. VGC. $50. Unidyne Mod' 1A Replica Wireless circa 1920. VGC $70. AR DX Club mags Jul 81-Sep 85, in binders. VGC $20. Micranta transistor tester. $15. Jeff L30409, QTHR. Ph: (03) 546 3940 AH.

DRAKE MN-75: matching network (ATU), incl SWR & pwr meters built in. Takes 300W. EC. $200. Murray VK3AAI. Ph: (053) 42 0447.

ICOM 735 MOBILE TCVR: & accessories. Brand new, still in box. Full warranty Fantastic mob rig only. $1195. Ph: (051) 74 1381 BH or (051) 99 2393 AH.

KENWOOD TS-530SP: plus remote VFO 240. MC355 mic & leads, plugs, etc. Still within guarantee period. Definitely no mods. Mint cond. Current model. Manual incl. $850. Frank VK3CFJ. Ph: (03) 877 5607.

TOWER: 35 feet, HD galv pole, self-stand in 2 parts (25' x 10') with platform, clamps for extra height to 40' or more. $220. Willem VK3BTQ, QTHR. Ph: (03) 758 5701.

SIEMENS MOD 100: C/W tape punch & reader. 50 Bauds. VGC $95. Siemens Mod 100 C/W keyboard, less punch & reader. $85 VGC. Bill VK3AQB, Ph: (03) 337 4902.

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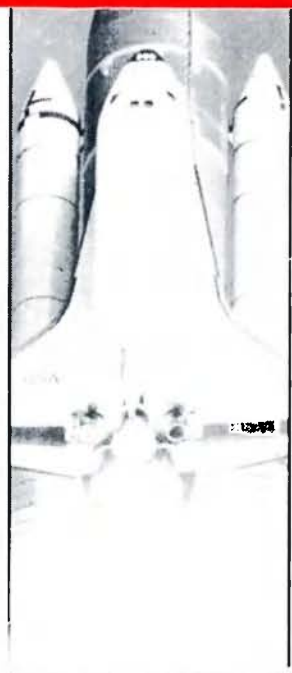

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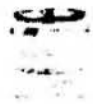

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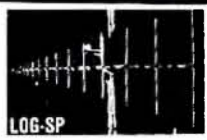

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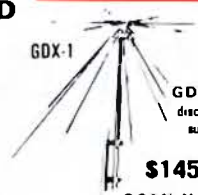

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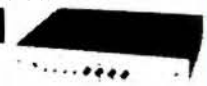

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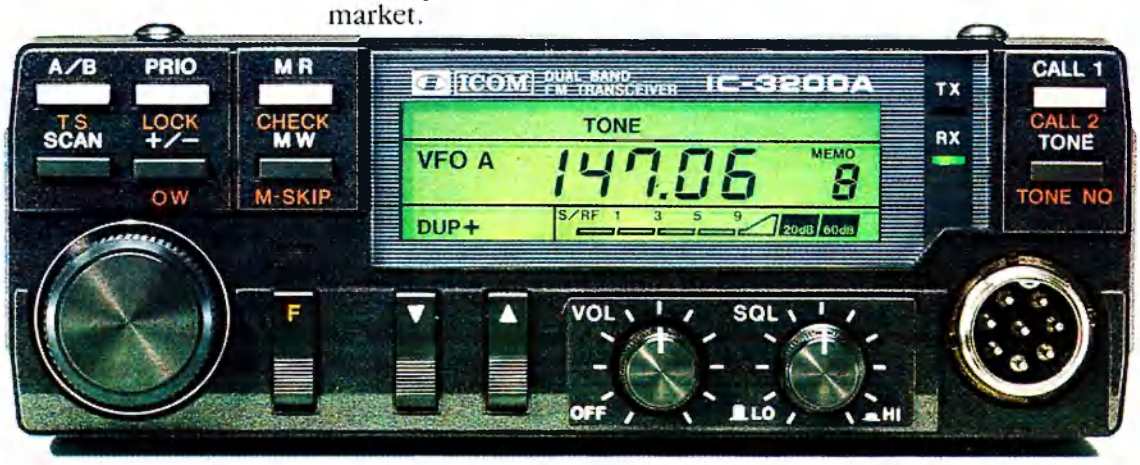

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Amateur Radio

VOL 54, No 3, MARCH 1986

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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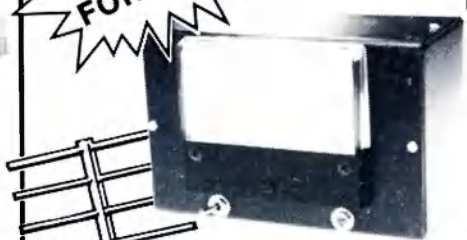

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Amateur Radio

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Photograph courtesy Ken McLachlan VK3AH

Joseph VK3CBQ and son Joseph VK3PIO in front of the transmitter and computer. See story this issue.

Technical Features

Special Features

Regular Features

Each year, the Publication Committee of the WIA select the winners of three Amateur Radio Awards — the Alan Shawsmith Journalistic, Higginbotham and Technical Awards. The Shawsmith Award is made available courtesy of Alan VK4SS, and is awarded to the author of the article which is deemed by the Committee as the best article for the year. The Higginbotham Award is awarded for meritorious service to amateur radio, whilst the Technical Award is for the best technical article printed in Amateur Radio magazine. Later in the year it is anticipated to print an article describing the origin of these Awards and the recipients to date of them. To be eligible for one of the Awards it is necessary to write an article for Amateur Radio. The 1985 winners were announced in last month's magazine.

This month's cover features one of the young members of the community who has been captured by the fascination of amateur radio. Joseph VK3PIO, was just 10 years of age when he sat for, and passed, his first amateur radio examination. See page 57.

With the Antarctic frequently being high on the much-wanted DX lists, Tony G4FAI, AR's London correspondent, looks at possibly the first experiments in radio from the South Pole, page 17. The environment was not at all kind to these experimenters and many lesser people would not have perservered as these early pioneers did.

The weather is holding up reasonably well for some antenna work and Ted VK4YG, page 8, explains how to get another season out of a TA33 beam whilst Joe VK4AGL, page 10, has some timely words for constructing a Rhombic. And for a novel approach, view the functional Yagi at the QTH of Ron VK3MB. Ron has used a rotary clothesline as the basis for his antenna.

DEADLINE

All copy for inclusion in the May 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 19th March 1986.

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Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162.** *by the* **22nd day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Watch the space below the index for deadline dates. Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgement may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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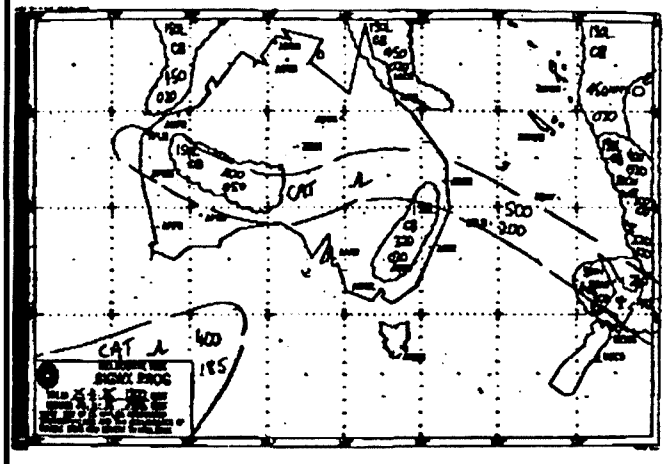

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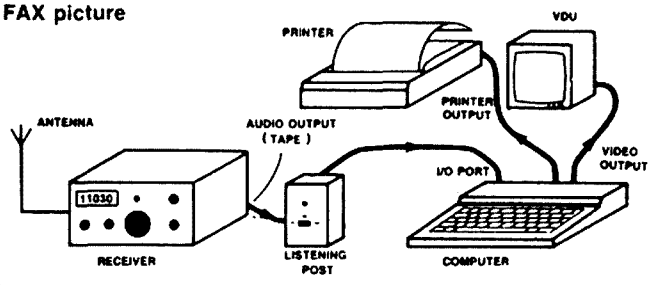

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Editor's Comment

THE FUTURE OF AMATEUR RADIO

By now you will all have had time to digest the suggestions for the future which were put forward in the discussion paper by VKs 3PC and 2ZTB and published in the February issue. Since then we have received relevant material from several other sources.

One of these is the announcement by the Canadian Radio Relay League of proposals by the Canadian DOC to restructure their amateur licensing system. Canadian amateurs have six months in which to discuss the issues and make formal comment to the Department. Essentially, a no-code entry level certificate is proposed, permitting the use of commercial transmitters (no home- brew) on VHF only, all modes. Passing a 12WPM code test would authorise HF operation as well. The highest level certificate would require advanced theory examination and grant all privileges, including home building transmitters and responsibility for repeaters etc.

Letters from our own members point out the expense involved in setting up a station with new commercial equipment, and I personally would be sorry to see a system under which people of our own Novice standard, for example, were prevented from building even a simple CW transmitter. The CRRL announcement, in its first paragraph, states the average age of VE amateurs to be about 55, with few young recruits. This all-too-familiar situation can only be aggravated by measures which make the initial cost of a station even higher than now. But on the other hand, *how many of our newcomers built their own first transmitter? How many (as well as your home-brewing Editor) have built their first (or any) transmitter over the last 40 years?* Seriously, we would like to know.

On a slightly different theme, a letter from Tony Tregale VK3QQ, is published in this month's "Over to You". In which he objects to the January editorial arguments in favour of joining the Institute. Tony is a member of the WIA and is well-known for his years of service as Federal EMC Co-ordinator, an onerous post for which no successor has yet volunteered. Presumably he is a member for reasons other than those mentioned in the editorial, so any suggestions he can add as to why VK amateurs should join the WIA would be appreciated. We do feel that his remarks about *"organisations like the WIA"* promoting discrimination *"to destroy the original concepts of the Amateur Radio Movement"* are totally unfounded. Without such organisations his intangible Movement would be only a number of leaderless individuals rushing off in all directions at once! Discrimination is not encouraged by our national amateur societies. Their existence and strength is the bond which prevents amateur radio from disintegrating into self-seeking anarchy. If this were the appearance of the hobby no responsible government would license it!

Bill Rice VK3ABP
Editor

THE RON WILKINSON ACHIEVEMENT AWARD

As outlined in Amateur Radio, March 1978, the WIA Award, The Ron Wilkinson Achievement Award was made possible by the generosity of Mrs Mary Wilkinson, widow of the later Ron Wilkinson VK3AKC.

Ron Wilkinson VK3AKC, of Geelong, died on 22nd March 1977. He had built up a reputation over many years for activities in the VHF/UHF parts of the spectrum in particular. In mid-year, Mrs Wilkinson proposed a donation of $1 100 to commemorate his passing. Discussions ensued between her and the Federal President and Executive Vice-Chairman of the WIA as a result of which an annual Award was selected as a suitable memorial.

Mrs Wilkinson's donation to fund this Award was invested in Government Bonds so that the annual interest would meet the costs of the annual award.

The winners of this Award are announced each year in the March issue of Amateur Radio.

DETAILS OF THE RON WILKINSON ACHIEVEMENT AWARD

NAME: The Ron Wilkinson Achievement Award.

FREQUENCY OF AWARD: The Award is to be made annually during the month of March — nominal date 3rd March and relates to the previous calendar year insofar as this is practicable.

REASON FOR AWARD: The Award is for special achievement in any facet of amateur radio. The following examples illustrate the level of achievement which will be taken into consideration in making the Award.

Outstanding communication achievement; Article for Amateur Radio Magazine; Holder of Australian DXCC; Development of state-of-the-art techniques; Involvement in Institute affairs; Microwave activity; Involvement in WICEN, Education, Clubs, or similar; Achievement in using amateur Satellites; Notable public service

These are only examples. As can be seen the Award is extended to cover the whole gamut of amateur radio activities.

THE AWARD: The Award is to be funded from the interest from the donation by Mrs Wilkinson, supplemented from Institute funds, if required.

The Award is made up of — *a Certificate; $50 cash; Books to the value of $50 from Magpubs and WIA Subscription paid for one year.*

In the event of a joint Award, then each recipient will receive — *a Certificate; WIA Subscription for one year and a proportionate amount of cash and books from Magpubs.*

METHOD OF SELECTION: The Award will only be available to amateurs from VK call areas; Preference will be given to WIA members; Individual amateurs may nominate or make personal application to the President of their Division by 31st October each year; The President of the Division is then to forward the most meritorious applications/nominations to the Executive by 30th November, only after satisfying himself that the applications/nominations are worthy of consideration; The Executive will nominate the recipient of the Award by 31st January, subject to Federal Council agreement if considered necessary; The Award will be announced in Amateur Radio for March. The nominal Award date is 3rd March each year — the birthday of the late Ron Wilkinson VK3AKC; In the event of no nominations forthcoming, the Executive may select a recipient.

CERTIFICATE: A condition is the Certificate will contain a list of all nominees year by year.

RECIPIENTS TO DATE

1977

Jointly by Wally Green VK6WG and Reg Galle VK5QR for a record-breaking 1296MHz contact.

1978

Jointly by Alf Chandler VK3LC for Intruder Watch co-ordination and Winston Nichols VK7EM for VHF and ATV work.

1979

Jointly by David Wardlaw VK3ADW and Michael Owen VK3KI for work concerning WARC 79.

1980

Cec Bardwell VK2IR for services to education in VK2.

1981

Ray Jones VK3RJ for services to the QSL Bureaus.

1982

Dick Norman VK2BDN for VHF/UHF activities.

1983

Jointly by Peter Smith VK1DS and Ken Palliser VK3GJ for design and construction of VHF repeaters.

1984

Lyle Patison VK2ALU for Moon-bounce Communications.

WINNER FOR 1985

The Institute had a difficult task again this year to select one winner for this Award from the very high standard of nominations received. It was eventually decided to grant the Award to Doug McArthur VK3UM for his activities involving EME and particularly the 'Aircraft Enhancement Mode' of VHF Propagation. This latter has stimulated much interest and correspondence during the year since Doug's article was printed in Amateur Radio. Many amateurs are now involved in experiments using this mode of communication.

From the involvement of so many amateur stations, it is hoped that a complete understanding of the mechanism of this type of propagation can be gained and, once again, the Amateur Service can make a significant contribution to the knowledge and use of anomalous modes of propagation to the benefit of other users of the radio spectrum.

Congratulations Doug — and keep up the good work.

REPEATER IDENT BOARD

Geoff Adcock VK4AG
32 Achilles Street, Kedron, Qld. 4031
Brian Mennis VK4XS
11 Jethro Street, Aspley, Qld. 4034

Several WICEN exercises in the Brisbane area, prior to 1980, showed a need for a portable repeater for WICEN use. Such a repeater would enable two metres to be used over a much larger area, and be of inestimable value in an emergency situation. At this time, the only repeater licences issued were for fixed stations, but submissions had been made to DOC to allow the licensing of portable repeaters. While this was going through the channels, work was going ahead with the assembly of the equipment in anticipation of eventual approval.

The basic idea was to use two normal transceivers interconnected through a control box, which would automatically carry out all the switching and identification functions. The main item to be designed was the control box.

Of the main functions in this box, the only modern design that appeared to be available was for the control board. This was found in the March 1979 issue of QST, in an article entitled "Using CMOS ICs". But, despite much searching, nothing could be found that would give the identification and timer functions. It was decided that a completely new board would be designed. As George McLucas VK4AMG, had recently designed and constructed a beacon identifier using an EPROM, it seemed that this was the obvious route to take.

The Mark 1 version gave eight different fixed length identifications, but, with a number of minor problems showing up in the circuitry generally. It was decided to re-design the board and at the same time, use an EPROM with more capacity. The final version, the subject of this article, is an identifier capable of 64 separate messages, each of a maximum of 250 bits long. The missing six bits give an optional three bits at the start of the message, and a mandatory three bits at the finish, to allow the detection of the end of the message. This would allow, for instance, eight call signs, each with eight different suffixes, indicating operational parameters. For example, VK4RWI normal ident, VK4RWI-H high SWR, VK4RWI-L low voltage, VK4RWI-D unauthorised access to repeater housing, etc. The advantage of the multiple call signs is that it allows the WICEN portable repeater to fill in as a backup to any of the repeaters around Brisbane should any of them fail. In addition, several personal call signs have been programmed to allow home testing. These have the suffix TEST.

This repeater board is not restricted to repeater use but could be programmed to send short CW messages and, used in this manner, would be of value in a contest.

The finished board is 155 x 90mm and contains seven CMOS ICs, one EPROM, a 5V regulator, plus a handful of other components. Current drain in the standby state is 20mA and in operation it draws 70mA, excluding the relay and any indicator LEDs, if these are used.

IC1, a 4047, is a multi-vibrator providing clock pulses for the board. The setting of this also provides a control for the speed of the ident, and, with this set to 10WPM, the interval between idents will be about four minutes, well within the DOC requirement of five minutes.

IC2, a 4011, gates a and b are used as an audio oscillator for the CW ident, with the square wave output filtered and shaped by the subsequent RC network. Gate c allows the clock pulses to go through to the counter when enabled by IC6a. Gate d is used as an inverter in the timing network.

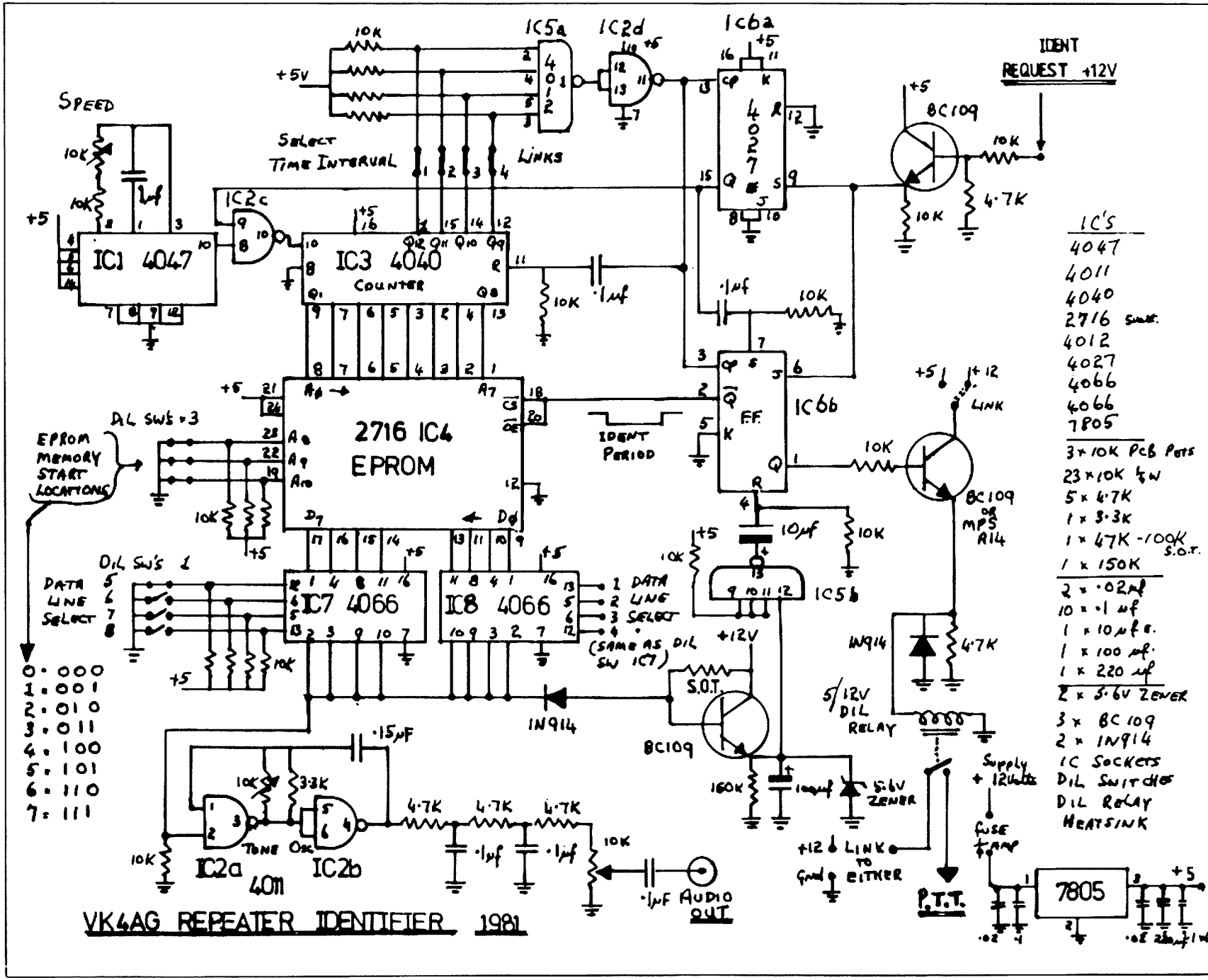
IC3, a 4040, is the counter. Outputs Q1-Q8 are fed to IC4, the 2716 EPROM, Q9-Q12 are fed to IC5a, a 4012, which sets the time idents. Connection between IC3 and IC5a is by means of four links. By installing one link only on Q9, IC3, the interval would be about 16 seconds. This is ideal for setting up and testing. When all links are in place the maximum time interval is available.

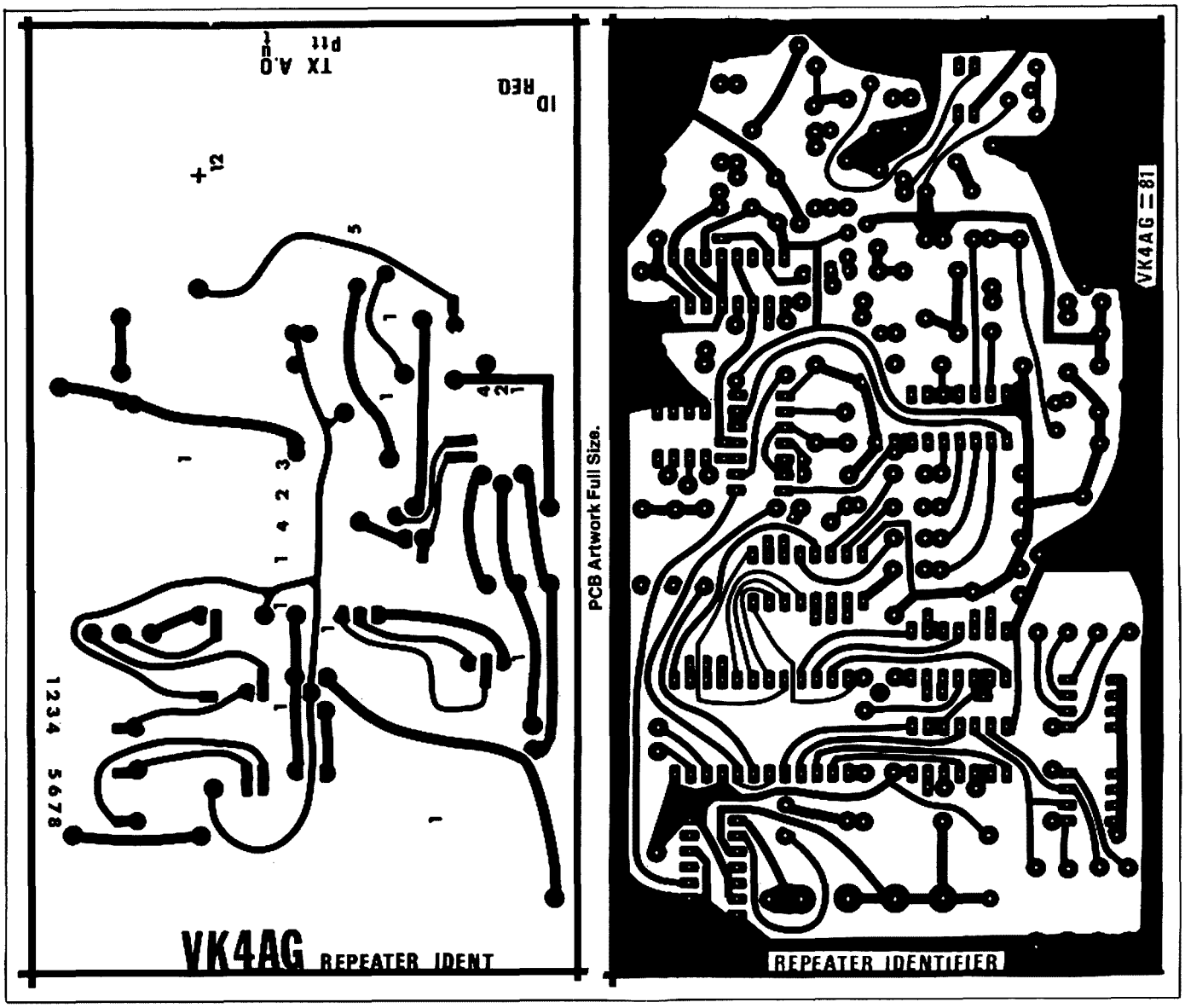
The output of IC5a is inverted by IC2d, which passes a clock pulse, resetting IC3 to 0 and resetting flip flops IC6a and b (4027) in preparation for the next request to ident. IC6a in turn closes gate IC2c stopping clock pulses from reaching IC3. When the request to ident comes from the control board, it causes a change of state of both IC6a and IC6b. IC6a turns on gate IC2c to allow clock pulses into the counter through IC3. One output of IC6b is fed to the PTT line of the transmitter through a buffer transistor, and/or a DIL relay. The PTT contact on this relay can be linked either to ground or to +volts, depending on the transmitter requirement. The other output of IC6b prepares the EPROM for use.

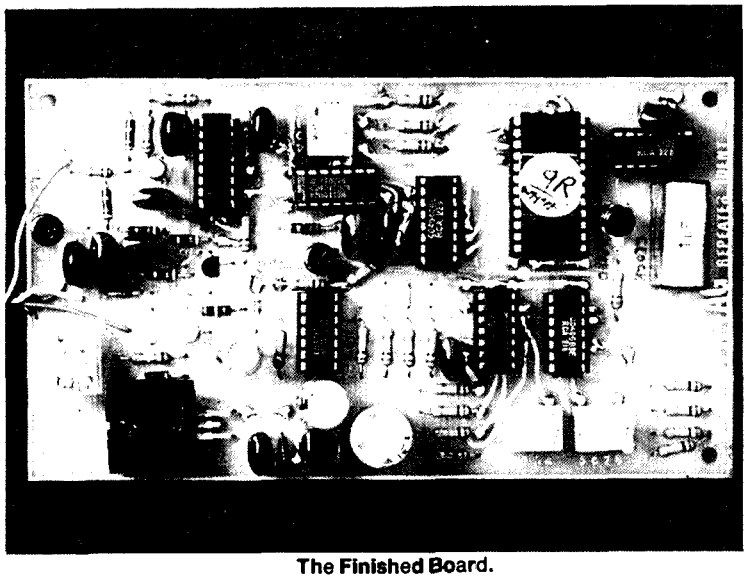
IC7/IC8 (4044) are electronic switches. Two banks of four DIL switches enable the required electronic switch which, in turn, enables selection of any one of the data lines from the EPROM. These electronic switches could be deleted and one data line permanently selected with a link. Another DIL switch is fitted to address lines 8, 9, and 10 on IC4. This allows eight different starting locations for the EPROM. Alternatively, these three lines could be addressed through a transistor interface and enabled by detector units for the various operating parameters. Another alternative would be for lines 8, 9, 10 to be taken to Q9, Q10, Q11 of IC3, giving eight different messages, each of 2k bits long, ideal for beacons, etc. The EPROM is programmed with the CW message on eight data lines. For example, the message 'VK4RWI' takes up approximately 110 bits on data line D0, in the first block of messages. Each bit is equivalent to a unit in normal CW and the EPROM is programmed accordingly. For example, V would be programmed as 101010111 and J as 1011101110111.

Output of IC7/IC8 is fed to IC2a, which toggles the audio oscillator on and off. It is also fed to a transistor pump circuit, which functions as an end of message detector generating a pulse at the output of IC5b. This in turn toggles IC6b switching the PTT line off and resetting the EPROM to the standby (low power) state. The bias resistor on this transistor is critical and is selected to ensure that the tone oscillator does not 'pop' in the standby state. The value varies between 47k and 100k. The capacitor on the emitter determines the tail length of the ident.

IC3 continues to count until all four inputs of IC5a are taken high. The output then resets IC6a and b in readiness for the next ident request.


VK4AG REPEATER IDENTIFIER 1981
Circuit Diagram.
SPEED
SELECT TIME INTERVAL
LINKS
IDENT REQUEST +12V
IC1 4047
IC2a 4011
IC2b
IC2c
IC3 4040 COUNTER
2716 IC4 EPROM
IC5a
IC5b
IC6a
IC6b F.F.
IC7 4066
IC8 4066
EPROM MEMORY START LOCATIONS
DIL SW's +3
DIL SW's 1
DATA LINE SELECT
0 · 000
1 · 001
2 · 010
3 · 011
4 · 100
5 · 101
6 · 110
7 · 111
IDENT PERIOD
TONE OSC
AUDIO OUT
BC109
IN914
S.O.T.
5/12V DIL RELAY
P.T.T.
+12 LINK TO EITHER
LINK
fuse
7805
IC'S
4047
4011
4040
2716 sub.
4012
4027
4066
4066
7805
3 x 10K PCB Pots
23 x 10K ¼W
5 x 4·7K
1 x 3·3K
1 x 47K - 100K S.O.T.
1 x 150K
2 x ·02µf
10 x ·1 µf
1 x 10µf e.
1 x 100 µf.
1 x 220 µf
2 x 5·6V ZENER
3 x BC 109
2 x IN914
IC SOCKETS
DIL SWITCHES
DIL RELAY
HEATSINK





The Finished Board.

The first version of this board was completed and tested by April 1981. Soon after DOC agreed to the issue of licences for portable repeaters. With the new licence and the complete control box, the VK4RWI repeater was immediately available for testing, and was put into successful operation in a WICEN exercise in early May 1981. (See RALLYING AND WICEN, July 1984 AR).

Apart from the portable WICEN repeaters several ident boards have been made and these are operational in two of the repeaters in Brisbane, two in Gympie, and at Roma, Mount Isa, and Weipa. Other repeaters proposed for Townsville and Terranora Lakes also intend to use the board.

The PCB is double sided and where connections are necessary to the top tracks at an IC. This is done indirectly by a link through the board to the appropriate leg underneath.

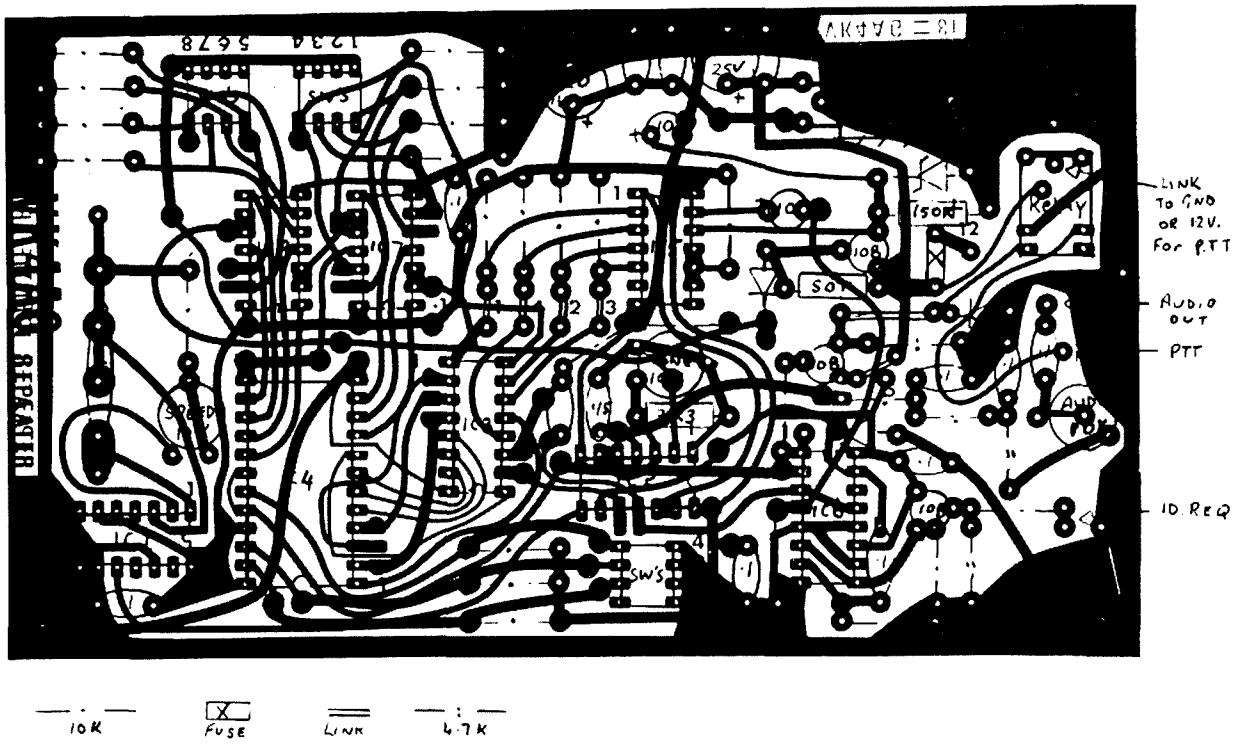
All resistors should be fitted first as some (about 10), are used as links from the top of the board to the bottom. In addition, there are about 50 other links through the board.

The circuit diagram and printed circuit board layout provided with this article should enable anyone to duplicate the ident board, but if there are any problems encountered, Geoff VK4AG, QTHR will be only too happy to assist.

Thanks to George McLucas VK4AMG, for the basic idea for this board and Phil Steen VK4APA for programming the EPROM.

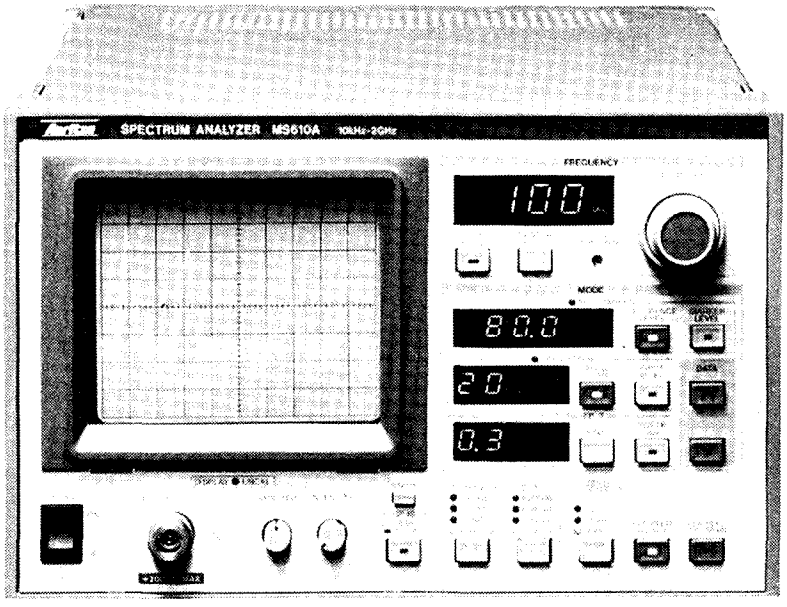
AR

Did you know . . . Fosters Lager became available to the public in 1889, after Mr W M Foster began brewing beer in Collingwood, Vic, in 1888.



UNDERSTANDING THE SPECTRUM ANALYSER

The March issue of ETI looks at spectrum analysers in general and the Anritsu MS610A in particular. Once the exclusive tool of rf gurus, the spectrum analyser is finding its way out of the closet and on to the bench top.



ALSO IN MARCH ELECTRONICS TODAY

- ★ Looking for clearer frequencies for shortwave broadcasts
- ★ The 8 mm video recorder is a CD quality audio recorder
- ★ Philips PM3360, micros analyse waveforms
- ★ Starting electronics — fault finding
- ★ Teaching the electronic brain with microprocessor development systems
- ★ Results from comet Giacobini-Zinner rendezvous

eti

REJUVENATE YOUR MOSLEY TA33

This three element tri-band Yagi antenna was one of the first commercial beams to appear on the amateur radio scene in this country, during the 1960s. Like most tribanders, it is a compromise and sometimes poses a few problems with tuning in order to obtain reasonable SWRs on each of the three bands.

Ted Gabriel VK4YG
PO Box 245, Ravenshoe, Qld. 4872

If you have one, or have recently obtained an old Mosley TA33, don't despair because with the modifications outlined in this article it will operate satisfactorily.

Firstly, if the antenna is an old one, it is recommended that the trap sections be completely overhauled for the following reasons:
Due to industrial fumes, salt laden sea breezes or tropical humidity, any triband antenna's performance will fall-off, due to corrosive effects within the traps.

Open the traps by carefully removing the plastic end covers, and separating the metal coil cover and the coil.

The coil is aluminium wire on a plastic former and connected electrically to the element tubes by steel PK screws, which will probably be rusted and corroded. It will therefore be necessary to replace the screws with new ones and whilst out shopping for these procure a tube of 'Penetrox A' or 'Aluminox' from an electrical supply house.

This material is a grease used in high voltage electrical cable jointing, and should be used where two dissimilar metals are likely to cause electrolysis and corrosion.

Clean the aluminium wire ends and element tubes, where they telescope, with steel wool or fine emery cloth and apply jointing grease before re-assembly.

If the plastic trap covers crack or crumble during dissembling, replace them with a suitable tape such as duct tape or other sealing compounds, but make sure they are non-metallic.

Take care to assemble the trap cover with the drain holes facing down, and ensure they are not blocked.

When triband beams came on the market, they were facetiously referred to as 'rotary bird perches', and indeed there can be trouble if the screws holding the inner ends of the driven element halves into the insulating blocks snap or pull out under the combined weight of large birds. The straw-necked ibis, a migratory bird from Siberia, is fairly large and visits Queensland during the summer months. It delights in landing on clear branches and beam antennas, so that it has an easy take-off.

To combat this problem it is advised to investigate the fitting of stronger screws, and also fit screws into the boom, just under the adaptor block of each element to prevent pivoting of the elements around the boom.

However, the writer has found there is one species of feathered friend, namely the mud-lark or peewit, that if they build their neat plaster nest on the boom without de-tuning it, it is better to leave them there! These particular species will not let any other bird, however large, anywhere near their nest, *or your beam*, for that matter. They even attack hawks with the ferocity of a pair of 'spitfires' attacking a squadron of bombers!

The problem of satisfactory tuning for all bands is overcome by the use of gamma matching sections. (See photograph for gamma matching). This system is used because it enables each band to be tuned separately.

The gamma match consists of two lengths of aluminium tubing, telescoping to form a tubular condenser and insulated from each other by plastic tubing, or other material, in the form of a sleeve. (See Figure 1 and Table 1 for dimensions).

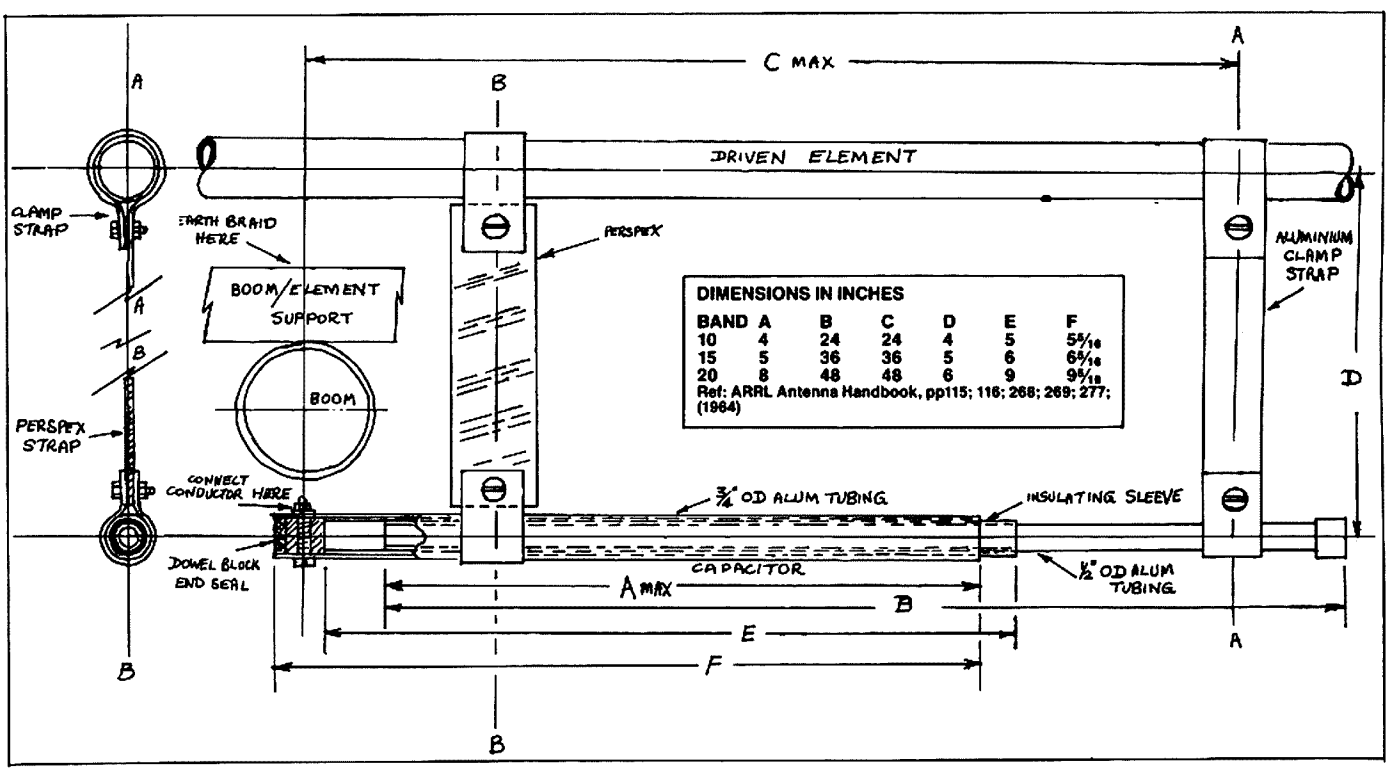
The driven element (DE) halves are joined together at the centre by a piece of copper wire and the exact centre of the DE is earthed to the base plate of an SO239 coaxial fitting, mounted on a plate attached to the DE support.

From the centre of the SO239 a copper wire is run to the end of each of the gamma match sections, which are disposed radially around one side of the driven element. Note that the 'hot' ends of the match sections are insulated from the element by perspex plates, whilst at the adjustment end, an aluminium clamp strap is fitted.

Don't be surprised when you start to tune the match sections if you find that the resonant frequency has moved up out of the top end of the band — this is corrected by fitting some pieces of ⅜" (9.5mm), TV element tubing into each end of the DE so as to lengthen it by upwards of 150mm.

Tuning can be carried out with the beam pointing upwards and resting on its reflector, or at a reasonable height, above ground.

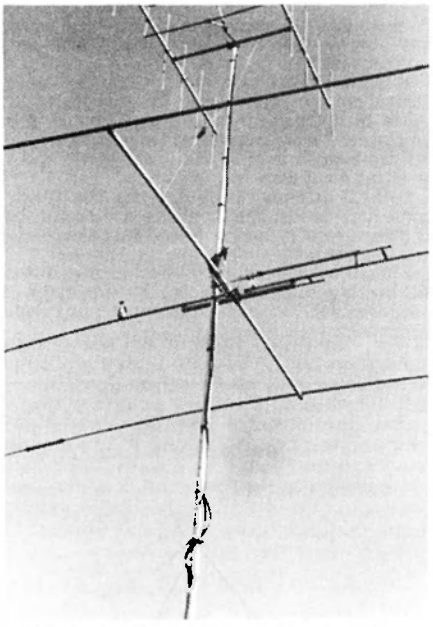
Use a noise bridge, if one is available, or an SWR meter. Adjustment of the director and reflector must also be made and intermediate tuning screw holes can be drilled between those already provided, but measure them to be the same each side.



DIMENSIONS IN INCHES

BAND	A	B	C	D	E	F
10	4	24	24	4	5	5 5/16
15	5	36	36	5	6	6 5/16
20	8	48	48	6	9	9 5/16

Ref: ARRL Antenna Handbook, pp115; 116; 268; 269; 277; (1964)



Mosley TA33 with Gamma Match tuning — complete with a colourful lorikeet.

Tuning of the gamma match sections is accomplished by adjusting the two dimensions, A and C, with reference to Table 1, the capacitance of the tubular condenser is approximately 15pF per inch (25mm), of engaged tubing.

When the best SWR has been obtained at the desired resonant frequency, carefully seal all ends and joints of the tubing. Do not use cheap, imported plastic tape as this will rapidly deteriorate in the sun and tends to lose its adhesive qualities. Even good quality tapes may need to be thread secured.

Remember to seal all UHF coaxial fittings as they are not waterproof.

Do not use jointing grease in the tubular condenser section of the gamma match, but use it on the end clamping strap.

If the element tubing, or the boom, show signs of surface corrosion, it is advisable to clean them thoroughly with steel wool, or fine emery cloth, and apply some coats of clear varnish.

The writers' Mosley TA33 is over 20 years old and with these modifications and regular maintenance, still gives a very good performance on all bands.

AR

1985 WINNER OF THE RON WILKINSON ACHIEVEMENT AWARD *see page 3.*

DOUG MCARTHUR VK3UM

IT GREW LIKE TOPSY

Allan Stephenson VK2PT
15 Bullsgarden Road, Whitebridge, NSW. 2290

As a boy I had been bird-nesting, catching crawchies, hunting in the ti-tree scrub with my Daisy air-gun (no bee-bees) and blunt pocket knife, played football and cricket on any spare allotment, and marbles in the middle of our suburban street. I had now reached that all important stage in a boy's life when I had to decide to write my first story. Only three pages on, and a well meaning friend introduced me to his crystal set! It was the most interesting thing I had ever seen, and while having no idea how it could be done, resolved that I would make one.

NOTHING WORKS THE FIRST TIME

My parents were not impressed by my ambitions, my Dad was not into such things but gave me enough money to buy, secondhand, one pair of earphones, a variable condenser, and a crystal. Mother emptied the baking powder container prematurely (the cardboard coil former), and an old fruit case from under the house provided the timber for a cabinet. A coat of varnish to keep the dampness out, and a little work with the aid of an old soldering iron heated on the gas ring and ultimately came testing time.

Now, how was I to know that nothing works the first time, I had learned something the hard way which was to be repeated so often in the years to come. The trick, of course, was to find a good spot on the crystal with the tip of the catswhisker and bingo! !

MORE MONEY FORTHCOMING WHEN IT WORKED

It would not be easy for me to describe the reaction exhibited by my parents and myself following this amazing break-through. Sufficient to say that an additional five shillings was forthcoming for the purchase of another set of earphones to be shared by two of the family, while the third person had a complete set.

The Great Depression was making it's presence felt at this time and people were giving things to one another as an almost every day occurrence, which is how I came by a good cabinet with a Bakelite front panel and wooden baseboard. Included was a few ceramic covered resistors with lead ends, some capacitors, and three battery type valves. The circuit diagram was a bit of a mystery, but putting it together was a "piece of cake" as all the connections were made with terminals. The Reinartz coil used some more round food package "tins" from the kitchen. Two 1.5 volt "telephone" batteries were the 'A' supply, and one 45 volts 'B' battery was the HT.

A potentiometer in the 'A' supply to the valve filaments was the volume control.

UNTOLD JOY UNTIL ELECTRIC MANTEL RADIO ARRIVES

This very humble beginning brought untold joy to our home bringing news, sport (the cricket tests), Charley Lawrence and his community singing (a modern innovation), Jim Davidson and his ABC Dance Band, to mention a few highlights, with a special bonus for me as the builder.

Soon after the beginning of my apprenticeship to the electrical trade, my parents purchased an "all electric" mantel radio. That part of the industry was starting to boom and radio looked as though it was here to stay.

The arrival of this new device put an end to the practical side of my radio activities for the time being. I kept the crystal set in my bedroom for many years and enjoyed the evening programs after technical school until the 11pm closing-down time.

After marriage, building a new home and virtually "settling-down" I found time to get out the ARRL Handbook. At this stage I knew very little about amateurs and their activities, but had built a number of single band receivers and had done a little listening.

An article in the local newspaper led to my meeting my first amateur on what was to be my lucky day. He gave me all the advice and information I needed at the time to get started.

GETTING INTO AMATEUR RADIO

With difficulty I was able to buy three Morse training records (78s) and by adjusting the governor on an old hand wound turntable, was able to get up to 18WPM. I had, by now, met another amateur who lived close by and he was most helpful in providing a variation in practice, from the "groups of five" on the records. Requirement at that time was 14WPM.

The issue of the "Experimental Licence" and a call sign on 2nd June 1948, was a day to remember, as I am sure it must be to most aspirants.

By now, I had accumulated enough receiver type components, together with some disposals junk of great value, and I was well on the way with the new transmitter.

It was to be home-built, of course, as there was no choice, and I had already decided on a single 807 in the final to be driven by a 6V6G crystal oscillator on the 40 metre band, and modulated by a pair of 807s. The antenna, after a little "try it and see" was a half-wave end fed Zepp, fed with home-made 600 ohm line with five inch Bakelite spacers. The modulation transformer was a receiver power transformer, until I was able to wind a more permanent one, and for a start the microphone was a carbon insert with the traditional wooden match connection at the rear, into a speaker transformer in reverse.

Metering was provided with milli-ammeters from disposal sources, with added multipliers or shunts as required. This provided up to 30 watts of plate and screen modulation AM.

Receivers were a bit of a headache, but in the meantime, I had bought a BC-312 receiver, ex US Signal Corps.

OUT OF THE CUPBOARD, INTO THE ROOM

As can be imagined, by this time I had moved out of the cupboard in the whole of the spare room and had taken over the spare room and was to an "all systems go" situation and enjoying myself immensely.

With this type of equipment experimentation was a keyword and I spent much time doing just that. Modification of circuitry, making bits and pieces, and construction of test gear to check and adjust modifications made the hobby more than a pastime. Being crystal locked soon rated high in the unpopularity stakes. Fortunately, at that time, the Clapp Oscillator was being advertised as a simple VFO. I built a rough one for a try-out. Frequently, this has been the wrong thing to do, but on this occasion there was both good and bad. The good was that on testing it worked reasonably wee with just a little drift, which was encouraging. The bad was the house had to be held steady whilst transmitting. When any of the family banged the "fly-door' the thin, but comparatively large area tuning condenser plates would vibrate, which didn't do anything for the carrier. The second version was a great improvement with ceramic insulation where possible, a change of condenser, a vernier dial (from disposals) with a bandspread of about nine inches, a pentode oscillator followed by an isolating stage, and no crystal.

With a thirst for DX, and with limited space, the antenna was replaced with a two element wire fixed beam which was fed by the 600 ohm line and Delta matched. It was unavoidably directed to the NW, which provided me with a bonanza of memorable QSOs.

Everything was getting bigger! The transmitter, it seemed, would ultimately engulf us, the junk box did, and book and magazine storage was becoming a problem.

Late in 1950, two metres, with a pair of 7193s in a unity-coupled oscillator and a modified ex radar receiver proved a little disappointing until several of the "boys" built three over three beam antennas and we were able to work all around the suburbs. However, a change in work, and the arrival of television meant banishment from amateur radio.

OUT OF RADIO FOR A TIME

Being more settled now, receiverless, transmitterless and almost junk boxless, I decided to build a receiver to see what was happening. In the middle of this construction I encountered one of my old amateur mates who told of how things had changed and advised me to call on yet another amateur who had recently *bought* some gear. And so I saw my first *Black Box* — a convincing winner.

My first transceiver was a FT-200, then came an SWR meter. With a half-wave dipole on 80 metres fed with 300 ohm ladder type TV feeder and a simple tuner and I was in business. How simple it was.

Still enjoying building, I built a Z-match tuner which is still used today and has matched several transceivers to a variety of antennas over a period, including the 80 metre dipole still in use of all HF bands, two triband quads fed with 70 ohm twin and a commercial triband beam with the same type of feed. The transceivers didn't worry because they did not, at any time, see worse than 1.2:1 SWR on 80, 40, 20, 15, and 10.

A COMPUTER IS SOMETHING ELSE

Now the computer is something else and I may have left it a little late. Nothing to build or probe with a meter, no mods or adjustments, but lots to learn and think about. It has certainly been invaluable in the preparation of this article which has been my first experience with the wordprocessor.

Much has been said, and will continue to be said about the many facets of amateur radio. While many have passed through to full time employment there will always be those who have no further wish than to participate at the hobby level, but for all there is ample scope.

I will say that many of my contempories have at some time needed the friendship and assistance of other amateurs, and for myself offer a big thank you to those who came to my aid. I am sure that the future holds much promise for amateurs who will continue to be represented in the forefront of advancement in electronics and particularly communications.

AR

THE RESONANT RHOMBIC

Joe Ellis VK4AGL
Burnside Road, Nambour, Qld. 4560

The Rhombic antenna is the ultimate in simple wire arrays, where maximum gain is required in a given direction. Many radio amateurs have aspired to a Rhombic, only to be deterred by space considerations. To be effective, this antenna needs to be big.

My interest goes back to World War Two, during the closing phase of which I was associated with the US Signal Corps. The military manuals of the day described the Rhombic in great detail and encouraged the 'troops' to utilise this type of antenna, even though the conditions for its erection might not be ideal.

Forty years after WWII ended, Bill Owen, of the University of Pennsylvania, sent me a copy of a 1942 publication, after learning of my plans to erect a large wire array.

The requirements for a Rhombic are simple, some poles, lots of wire, and a good antenna tuner.

POLES

There may have been a time when a radio enthusiast could have 'won' a few poles from the local power company, or council, but those days are long gone, as I soon discovered. It took six months to find an honest timber-cutter who was prepared to cut down, and deliver, the necessary trees for QRP dollars. I selected some Iron Barks, which were growing on the side of Mount Buderim, not far from my QTH. For any conservationists who may be getting excited at this stage, may I say this was only the second time in Australian history that the sound of an axe had rung out in this particular forest, and culling is essential for proper growth and timber production.

When cleaned up, the poles were a little over 50 feet (15m) in length and were allowed to dry out for some weeks. They were then painted with preservative, fitted with climbing pegs and capped with aluminium hats. Erection of the poles was done by a commercial contractor. It is not a job for an amateur due to the large weights involved. I stuck to this theory, even though there was no shortage of volunteers from my local radio club.

Anyone who has put up a long length of wire will have gone through the problem of sag. Fortunately I had access to disposal wire consisting of a strong steel cable, with two copper wires moulded alongside. Telecom call it drop wire. Properly tensioned, this wire stays magnificently taut and a joy to behold. Only the copper wires joined together were attached to the feed line.

Each side of the antenna is 329 feet (100m) long and is run in one length via insulated pulleys mid-way.

The wires were tensioned and attached by galvanised chain and turnbuckles of robust

General view of the antenna.

proportions. Prior to the erection of the poles, there had to be a decision on which frequency was to be primary, and after a lot of information from many sources I chose a compromise apex angle, suitable for 10 and 15 metres, the 1973 Dipole and Long Wire Handbook by Ed Noll W3FQJ, an excellent reference publication. A further decision had to be made as to a suitable target for the array and, after a look at a Great Circle Map centred on Brisbane, I chose the city of Los Angeles, which gave me an extended line to New York. The reverse bearing goes across the Indian Ocean to South Africa. It was a simple matter to establish the bearing by reference to the 10 metre beacon maintained by W6IRT, from a Hollywood QTH. The beacon runs seven watts and I have used it for years. At the moment it runs practice CW at 13WPM, sending in mixed groups, which is good practice for those interested in learning the code. I aimed my Rhombic down this path.

Having chosen the target, I found I was a little short of real estate and had to open diplomatic relations with my neighbour, a widow known to have a 'peppery' temperament. I guaranteed no interference to her television reception, but she was more concerned about her horses. I received conditional approval to erect a pole on her farm as long as I did not frighten them. Simple trigonometry was used as an aid in locating the poles and determining space requirements. The actual antenna in use here covers an area of 300 feet (91m) long by 140 feet (42m) wide. Ideally, the location should be level and away from buildings. As with any antenna, it also needs to be away from the ground for maximum performance. Having said that, my Rhombic is near and over the tops of trees, the ground is not level, and the height, at average, 45 feet (13.5m) is too low. Nevertheless, it works superbly.

ANGLES

Referring to Figure 1, note that the two angles are marked, TILT and APEX. Either can be used in the design of a Rhombic; the other parameters are leg-length and height above ground. The total length of wire in the array is made an odd multiple of an electrical quarter wavelength. The whole object is to combine the major lobes of radiation so that the antenna

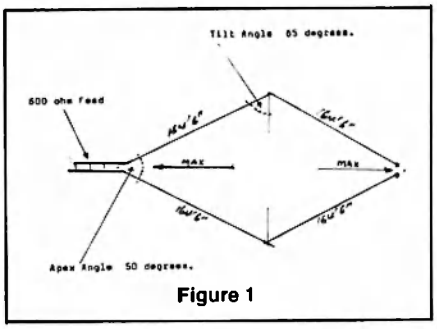


Figure 1

radiates and receives at the angles which normally are most effective for communication on the frequency to be used. Amateurs are usually attempting to achieve wave-angles of 0 to 20 degrees above the horizon. It is not within the scope of this article, nor am I competent to explore fully, Rhombic design. However, Figure 2, which is a wartime chart is included for interest.

either shortened or shielded. Remember, this antenna is capable of being operated on 160 metres through to 29MHz, and you will be lucky not to strike this trouble on at least one frequency. The antenna became operational during January 1984 and the first impressions were of incredibly quiet reception and reports from overseas amateurs indicated the station sounded better on the Rhombic. Subsequent reports show a gain of one to one and a half S points on 10 and 15 metres, and even on 20 metres, when compared with a TH6, which is no slouch on these bands. These are average observations, on many occasions the wire antenna is much better than the Yagi, in no uncertain terms. But it is in the noise-free reception that it becomes a winner.

Since the resonant Rhombic is claimed to be bi-directional, with maximum lobes in a line bisecting the apex angle, I looked forward to interesting results in the reverse direction. I duly came up on the ANZA net and was shattered to find results were terrible, with the Yagi way out in front. Baffled, bothered and bewildered, I shot off an air mail letter to W6AM

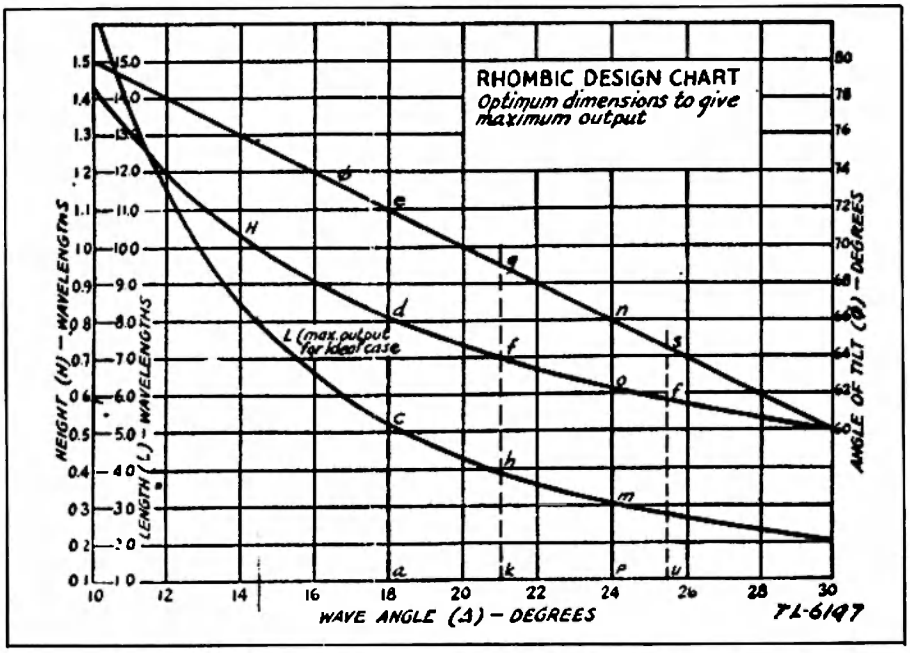
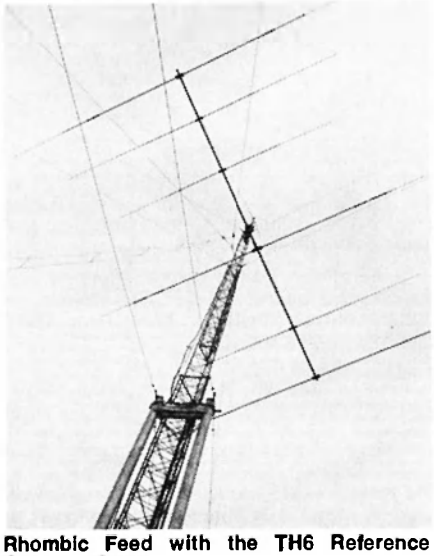
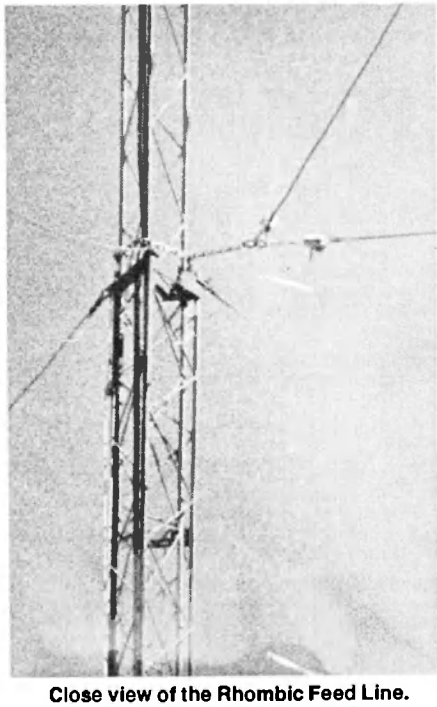


Figure 2 — Rhombic Antenna Design Chart for Maximum output design. The top curve is tilt angle, middle curve, height above ground and the bottom curve is leg length. For example: If you require a wave angle above the horizon of 18 degrees, draw a vertical line through point a (18 degrees on the wave angle abscissa). The answer would be — leg length 5.25 wave lengths, height 0.81 wave lengths, and tilt angle 72 degrees.

Usually a Rhombic is fed via 600 ohm open wire transmission line. Spacing wire of gauge 14 to 20 at five inches (127mm) will achieve a characteristic impedance within the range of 600-700 ohms. Spreaders were made of perspex obtained as scrap from a signwriting company. It is beastly material to cut into strips; I found a sharp electric saw necessary. Open wire feed line is the most efficient method of transfer of RF to an antenna, and has a velocity factor of unity. It may be necessary to alter the length of the feedline to minimise RF feedback in the wireless room. While on this subject, I found it necessary to tidy up most of the leads in the shack. Wires to extension speakers, and ALC, plus relay lines to linear amplifiers were



Rhombic Feed with the TH6 Reference Antenna above.



Close view of the Rhombic Feed Line.

explaining my tale of woe. Don Wallace ran a stable of 13 Rhombics and had kindly lent me much data, collected by him over a long lifetime. His reply was — *"The books say a Rhombic is bi-directional. You and I have found otherwise. It is bi-directional only if there is a feed line on both ends. The far end is then terminated in the station, via relays. It is then capable of awesome front to back ratios, measured at 56dB here"*. It is sad to relate, Don became a silent key as I was putting this article together.

TUNER

I mentioned the need for an efficient antenna tuner. The 'Transmatch' has been around for many years, with the original circuit being published in QST. I used one until W1FB advised me of a variation on the original, called the SPC. It uses the same components but covers a much wider frequency range. It has a much better harmonic attenuation than the transmatch. In order to make it include the 29MHz FM frequencies, I found it necessary to pay more attention to layout and use copper strip, rather than wire, to connect the bits and pieces together. The balun was made from cores which are regularly advertised in Amateur Radio. These items come complete with excellent directions. The SPC circuit is featured in late issues of the ARRL Handbook.

In the 18 months that my antenna has been in operation, it has been used on all amateur frequencies. It was used on 22nd June, when the 12 metre band was opened for American amateurs, and excellent reports were received. It appears to be reasonably directive on 30 metres towards the United States, and is also used on 40 metres, in that direction, with good results.

If I could discover how to turn the farm around, I would dispense with Yagis. Since I don't ever anticipate being able to do this, I can only express my gratitude to Professor Yagi and his friend, Mr Uda, for their compact invention. 'Project Rhombic' would never have 'got off the ground' without the encouragement and practical help of Roy VK4ARU, who was a tower of strength throughout the construction phase.

AR

WHERE DO MAGIC FORMULAE COME FROM?

Bruce Devenish VK1BUB
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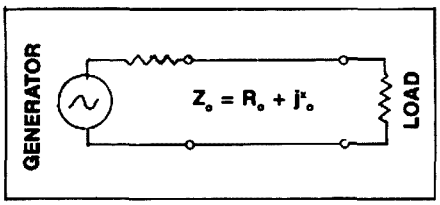
Whilst browsing through an old Radio Engineers reference book[1] I came across the following formula:

$$\frac{P_m}{P} = \frac{(S+1)^2}{4S}$$

where

P_m = power that would be delivered if the system were matched
P = power delivered to the load
S = standing wave ratio of mis-matched impedance referred to as Z_o

and the following diagram



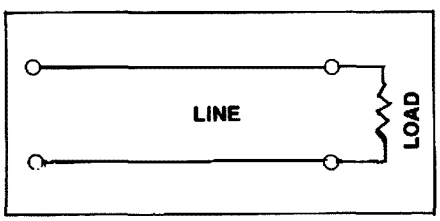
I wondered where this formula came from so I decided to experiment a little and see if it could be derived.

I began with the following definitions:

Standing Wave Ratio (S): The ratio of the maximum voltage to the minimum voltage along a transmission line.

Reflection Coefficient (ρ): The fraction of voltage reflected back at the mis-match.

So we have a line and a load.



Let V_m be the voltage seen at the load if there is a perfect match.

Then maximum voltage along the line, when there is not a perfect match is equal to:

$$V_m + \rho V_m$$

and the minimum is equal to:

$$V_m - \rho V_m$$

So returning to the definition of SWR — this is definition A

$$\therefore S = \frac{\text{maximum voltage}}{\text{minimum voltage}}$$

$$= \frac{V_m + \rho V_m}{V_m - \rho V_m}$$

$$= \frac{V_m(1+\rho)}{V_m(1-\rho)}$$

$$= \frac{1+\rho}{1-\rho}$$

Now let us think about power. Maximum possible power into the load

$$P_m = V_m^2/R$$

Now, if ρV_m is reflected back, the lost power is

$$\rho^2 V_m^2/R$$

$\therefore$ Power delivered to the load:

P = maximum possible power — reflected power

$$= \frac{V_m^2}{R} - \frac{\rho^2 V_m^2}{R}$$

$$= \frac{V_m^2}{R} \times \frac{(1-\rho^2)}{1}$$

Combining these two formulas to the form required gives definition B:

$$\frac{P_m}{P} = \frac{V_{oc}^2}{R} \times \frac{R}{V_m^2(1-\rho^2)}$$

$$= 1/1-\rho^2$$

Now from equation A:

$$S = \frac{1+\rho}{1-\rho}$$

$$S(1-\rho) = 1+\rho$$

$$S - S\rho = 1+\rho$$

$$S - 1 = S\rho + \rho$$

$$S - 1 = \rho(S+1)$$

$$\therefore \rho = S - 1/S + 1$$

Substituting for ρ in B we get:

$$\frac{P_m}{P} = \frac{1}{1-(S-1/S+1)^2}$$

multiplying the top and bottom line by $(S+1)^2$ gives:

$$= \frac{(S+1)^2}{(S+1)^2 - (S-1)^2}$$

$$= \frac{(S+1)^2}{S^2 + 2S + 1 - (S^2 - 2S + 1)}$$

$$= \frac{(S+1)^2}{S^2 + 2S + 1 - S^2 + 2S - 1}$$

$$= \frac{(S+1)^2}{4S}$$

Which is the magic formula.

It can be seen that if $S = 1$ then $P_m = P$; ie the power into the load is the maximum possible. As S increases, the power into the load decreases.

This is all very interesting. I wonder how well it represents the real situation. The only way to find that out is to conduct an experiment. *That I must do, sometime!*

REFERENCES:
1 Reference Date for Engineers — Fourth Edition. International Telephone and Telegraph Corporation.

AR

***Did you know . . .** Young, in NSW, was the first town in Australia to introduce electricity as a complete town-lighting system, in 1888.*

Bill and the Dummy Load

Ted Holmes VK3DEH
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Bill Blitheringtwit was in a spot of trouble. Nothing very serious, but he considered he should do something about it. He had broken his dummy load. It was a stupid thing to do, he admitted. He had trodden on it. For his dummy load had been an electric globe. And it didn't look very likely he would be able to get another like it. The original had been from a railway carriage. these days the wretched trains were fitted with those irritating fluorescent tubes — quite unsuitable.

He fossicked away in a heap of old magazines stacked in a corner and found an article written around 1942. This was it! A perfect design for a dummy load. All he needed were a few old resistors and a box to put them in, plus a couple of PL 259 connectors. It looked like a piece of cake.

Humming unmelodiously to himself, Bill wandered out to his garage. A slight altercation ensued with a somewhat stiff door, resulting in some bent hinges, but Bill gained access to his Aladdin's cave. There he happily rummaged through his collection, like a scientist exploring an archaeological site. Finally he found a small box, PL 259 connectors (which needed a bit of de-soldering) and an assortment of resistors. Now he was in business.

He returned to his shack with his treasures. Somehow or other he had to get 50 ohms out of those resistors and also find a way of putting them in parallel. There was a formula . . . He sat down with pencil and paper and the end result was a large collection of different size and value resistors, all to be assembled in parallel.

Out came the soldering iron and Bill happily joined the handful of resistors into a bundle and twisted the leads at each end together. He finished up with a strange-looking maze. This looked fine. He heated up his iron and began to pour solder on one end of the bundle, making sure that plenty ran all through the network of leads. The collection grew very hot and he had to wait a while for it to cool down before he did the same with the other end. Fine business!

So far so good. As a concession to the article in the magazine, he thought he'd better test the resistance on a meter before putting the thing in a box. He applied the prongs of his meter. What? Three Kilohms! Can't be right. He got the same reading every time. Better snip a few resistors off. Bill did this several times and each time the reading got higher.

Finally he finished up with one solitary resistor and that fell apart in his hand as he was looking at it.

AR

CHANGE OF ADDRESS OR CALL??

When you change your address or call sign **ALWAYS** remember to notify your Divisional Office and the Federal Office.

If possible please include your recent magazine address label.

This is most important for us to keep our records up-to-date and to ensure you receive your magazine without interruption — back issues are not always available.

TROPOSPHERIC SCATTER PROPAGATION

Ian Roberts ZS6BTE

INTRODUCTION

During the last 20 years or so, with the appearance of high power UHF amplifiers and low noise signal amplifying devices, a wide-band propagation mode capable of conveying VHF signals over distances of 800 km or more has become increasingly important in high priority commercial and military links.

The mode is loosely referred to in the industry as "tropo" or "tropo scatter".

In recent years we have recorded interesting long distance VHF and UHF phenomena as noted by radio amateurs. It is evident though, that many of the reports are rendered "tongue in cheek", without much understanding of the propagation phenomenon witnessed and it is commonplace to see E, sporadic E, F^2, E/F^2 back scatter, tropospheric ducting and tropospheric scatter confused. The first five modes depend entirely upon solar radiation of the upper ionospheric layers for success, the latter two have nothing to do with solar activity. Tropospheric ducting is a freak occurrence involving inversions or peculiarities in the moisture content, pressure, and temperature domains of the atmosphere in the vicinity of the ground and hence may be detected by antenna systems. The mode is obviously unpredictable. Accordingly, with solar activity presently at a low level, the only long distanoe mode left for the VHF enthusiast is tropo scatter. Radio amateurs, with their unique talents, and privileges, are in a particularly good position to add greatly to the existing knowledge of tropo scatter.

BACKGROUND AND HISTORY OF TROPO SCATTER

Marconi described tests in 1933 at 550 MHz over a 270 km path between Rocca di Papa, Rome and Cape Figari, Sardinia.

In 1949 the USA froze the issuing of television broadcast station licences because of propagation beyond anticipated boundaries and co-channel interference on a massive and unexpected scale.

By 1952 Bell Telephone Laboratories, primed by much theoretical speculation and increasing empirical evidence put forth their "Polevault" VHF over the horizon communications system.

The US Air Force, in about 1955, took the plunge and commissioned a link over hostile territory, thereby obviating the need for numerous conventional line-of-sight links.

And that is where the mysteries of tropo scatter propagation have been largely hidden, in classified matenal, generally not available to the radio amateur. Additionally the precise methodology of tropo scatter remains ill-understood even in professional circles and most performance evaluations are based on empirical data collected during field testing.

CONCEPTS AND PARAMETERS

Various important parameters, peculiar to the mode, need further examination. The K-factor, generally K4/3 radius of the earth. Much as light passing through a prism refracts towards the denser medium so a VHF beam passing along the surface of the earth tends to refract along the denser air at the surface to achieve a distance considerably more than the true line-of-sight condition. This accounts for the fact that radar, operating for example at L-band (1100 MHz) can "see" a target below the visible horizon (which is itself below the physical horizon) Fig 1.

Typically K is described as K4/3 at frequencies below about 1GHz, meaning over the horizon propagation but under severe conditions may fall to below unity.

$$\text{Ganerally, } K = \frac{\text{effective radio earth radius}}{\text{true earth radius}}$$

and is greatly dependent on the surface refractivity index of the terrain over which the VHF beam is

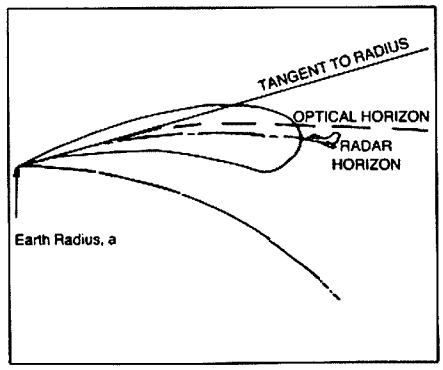


Fig 1: Bending of antenna beam due to refraction (True earth radius, a)

passing. In South Africa a ball-park value for this variable would be 280. The VHF-UHF Manual (RSGB) has an interesting description of this refractivity index and derivation.

There is a non-correlation

1) in the signals received by two adjacent antennas from a dual polarisation transmitting site when the receiving antennas have opposite polarisation eg: horizontal/vertical, Fig 2.

2) in the signals received (same polarisation) by two antennas spaced a finite distance apart, eg: 100 wavelengths, Fig 2.

3) in the signals received (same polarisation) by two antennas receiving signals widely separated in frequency, eg: 10 MHz. Fig 2.

4) in the signals received by two antennas with slightly different beam headings. Fig 2.

These characteristics are put to good use in professional systems. For example, a tropo link with "quad diversity" would often utilise parameters 1) and 2) and be capable of receiving both horizontal and vertical polarisation on each of two antennas spaced apart as above. Each antenna, similarly, would transmit horizontal or vertical polarisation on a common frequency. FM is currently the preferred mode. The various signals are combined at IF (pre-detection combination diversity). Since the respective noise inputs add in random fashion and the signals linearly, a higher signal to noise ratio is obtained. Typical signal to noise ratios (with psophometric weighting) are plus 40 dB — good enough for a good quality telephone line or medium speed data with error correction.

A representative tropo link uses quad diversity, 27 metre parabolic antennas, 10 kW CW at 900 MHz, carries 132 FDM telephone channels, distance 500 km. A link of this nature would otherwise require 10-15 line-of-sight microwave stations.

GEOMETRY OF TROPO SCATTER PATH

R is 4/3 earth radius (8448 km)

d is great circle path distance

h_1 and h_2 respective antenna heights above sea level.

h'_1 and h'_2 height of radio horizons above sea level

d_1 and d_2 great circle distance between radio horizons and respective antennas.

The scatter angle $\theta = \theta_0 - \theta_1 - \theta_2$ radians where $\theta_0 = d/R$

$$\theta_1 = \frac{h_1 - h'_1}{d_1} + \frac{d_1}{2R}$$

$$\theta_2 = \frac{h_2 - h'_2}{d_2} + \frac{d_2}{2R}$$

Typical scatter angles are up to 4 degrees. Each 1 degree increase in scatter angle introduces an additional 10 dB path loss and high value scatter angles are avoided in professional systems. This is easy when one can choose a mountain top site.

In Fig 3 the zone where the beams intersect is called the scatter volume and the properties of this volume define the quality of the scatter path.

AMATEUR APPLICATION OF TROPO SCATTER

Inspection of a standard 4/3k path profile indicates that one may not expect a local radio horizon (d_1 and d_2) of more than 30km assuming 20m antenna height and level ground.

Under these conditions could one expect a tropo scatter path to exist between Johannesburg and Port Elizabeth on 50 MHz using typical amateur radio gear?

In order to address this question it is necessary to calculate or estimate the following:

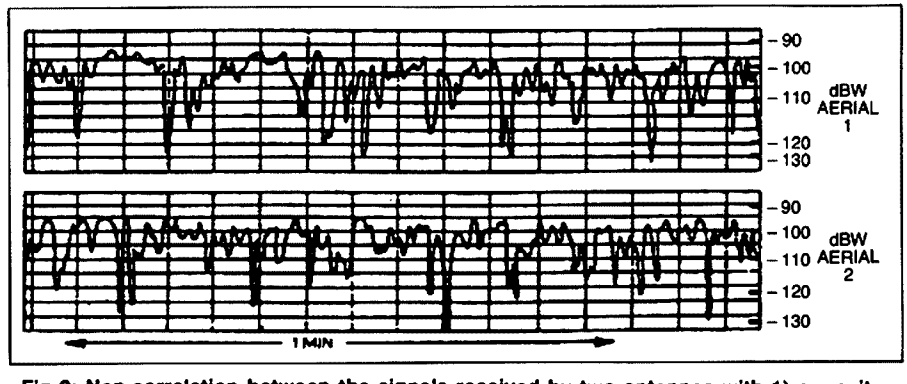


Fig 2: Non-correlation between the signals received by two antennas with 1) opposite polarisation 2) physical separation of 100 wavelengths 3) slightly different beam headings 4) wide frequency separation.

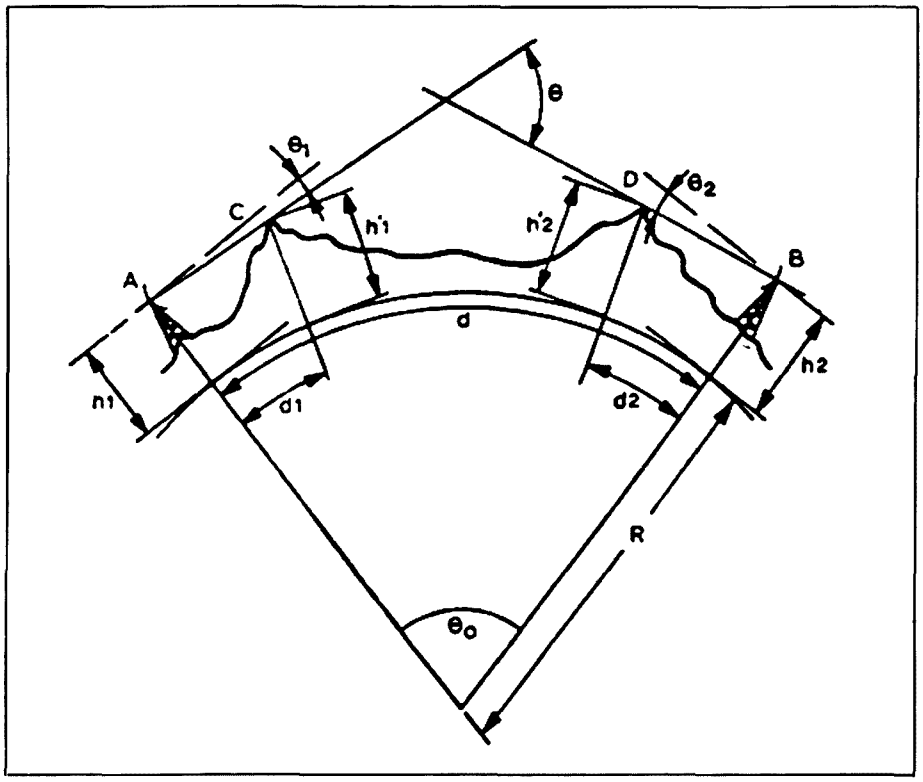


Fig 3: Geometry of Tropospheric Scatter Path

a) distance
b) scatter angle
c) path loss
d) system noise temperature
e) signal to noise ratio, which would give an indication of the signal to be expected.

a) The *distance* between Johannesburg and PE is calculated from the great circle path distance equation by assuming JHB to be the point of departure and using the respective latitudes and longitudes.
So d = 872km

b) Scatter angle
The take-off from the PE end is particularly advantageous with the beam passing over the Sundays River valley and establishing a radio horizon in the Patterson area at about 60km. So, retaining the nominal 30km radio horizon at 20m antenna height in JHB and remembering to use the same units in the equation: h_1 in JHB about 2km with horizon at 1.83 km (hills south of Alberton)

h_2 in PE at 0.5 km with horizon at 0.48 km (60km out).

then scatter angle

$$\frac{872}{8448} - \frac{(2.0 - 1.38 + 30)}{30} - \frac{(0.5 - 0.48 + 60)}{16896}$$

$$= \frac{}{16896}$$

= 0.0769 rad.
θ = 4.4 deg

c) Path Loss
The medium path loss L_p consists of three components, viz.

$L_p = L_b + L_s - 0.2\,(N_s - 310)$dB

where L_b is the free space path loss

$L_b = 92.4 + 20 \log d + 20 \log f$ dB

where d = distance in km
f = frequency in GHz
ie L_b = 125.18dB
and L_s is the all year median scatter loss normalised at a surface refractivity index

N_s = 310

$L_s = 57 + 10\,(\Theta - 1) + 10 \log (f/0.4)$ dB

= 81.96dB

The factor N_s is in terms of CCIR recommendations and is mapped globally. In South Africa the value of N_s varies between about 310 and something much less (eg the generally taken 280) depending on water vapour content, pressure and temperature, to name a few components.
So L_p = 213.14 dBi (this is an EME - type path loss)

d) System Noise temperature

$$T_{sys} = \alpha\,(T_g) + T_o\,(1 - \alpha) + T_1 + \frac{T_m}{g_{m-1}}$$

α = 0.8

T_g = 290°K

T_o = 290°K

T_1 = 150°K

T_m = 600°K

g_{m-1} = 32 (15dB)

The terms were explained in reference 3) T_{sys} = about 460°K
The receiver noise power ratio P_n consists of the "pure" KTB noise modified to incorporate the receiver noise figure ie FKTB where F is the receiver's noise figure. If one assumes the receiver's RF stages to be T_1 and T_m with filter losses of 1 dB then F_1 is about 2 dB. In a bandwidth of 1000 Hz P_n turns out to be — 168 dBW

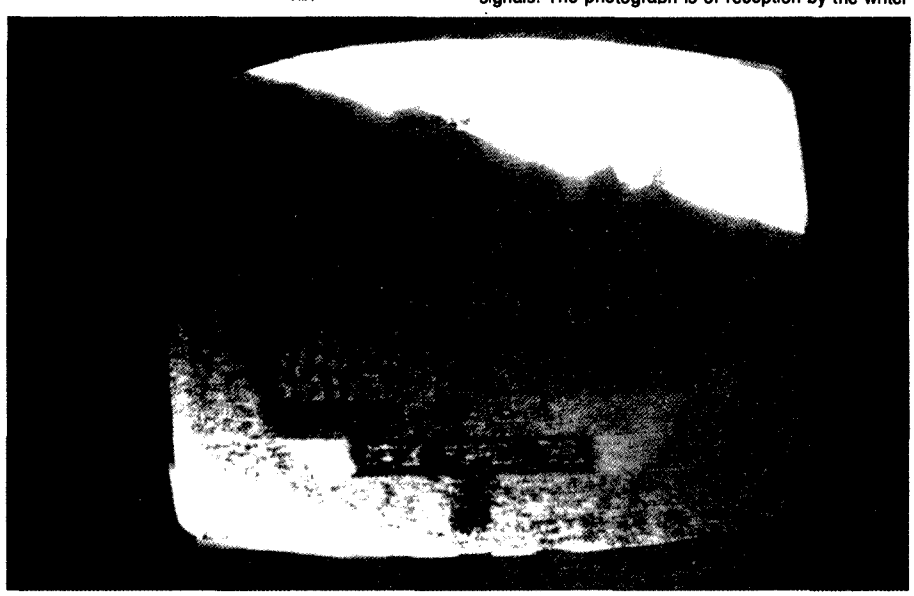
e) Signal to noise ratio
SNR = $P_o + G_t + G_r - L_t - P_t - P_n$ (see ref 3)

using 100W PEP into 12 dBd antennas SNR = 1.14 dB
However, since an isotropic path loss was used about 5 dB should be added to this. The ear should have no trouble tracking a beacon-like signal at this sort of SNR, indeed it should be continually audible with signal levels changing in sympathy with changes in the surface refractivity index.

For example an increase in this quantity from 280 to 300 would reduce the path loss by 4 dB and increase the SNR accordingly.

GENERAL

As a matter of interest the typical heights of the scatter volume (assuming un-oostructed paths) are listed below:
distance 150km 300-2000m
300km 600-3000m
600km 3000-20,000m
The shorter paths are characterised by deep, fast fading. Long hops show a steadier path loss consistent with the median path loss for that month. It is suggested (in classified literature) that the best tropo conditions prevail during a hot summer afternoon, while the worst conditions occur during winter nights.
Much remains to be researched, or remains unreported. For example, what is the effect of a thunderstorm on the scatter volume? What happens when a tropospheric duct intercedes? Is the north/south path more favourably propagated as in F²/TEP propagation?
Numerous high power RF sources exist in South Africa, notably the SABC's FM and TV broadcast signals. The photograph is of reception by the writer



Tropospheric Scatter reception: the SABC Nelspruit ch. 24 TV transmitter received over a scatter path of 270km. The shadowing is typical of a camera with focal plane shutter.

of the Nelspruit (ch 24) TV transmitter on 495.25 MHz over a path of 270 km. This signal is continually detectable at the QTH in Pretoria which has an inferior radio horizon in all directions. Fading on this signal is in excess of 15 dB, with several cycles per second being typical over this distance.

CONCLUSION

A method has been illustrated whereby VHF signals can be propagated much further than the normal line-of-sight, point-to-point, condition.

REFERENCES

1) VHF-UHF Manual (RSGB)
2) Tropospheric Scatter (Point to Point Communications, Feb; 1964)
3) System Noise Temperature and System Performance (Radio ZS, Sept, 1982)
4) Radio Relay Systems (Thomson-CSF 1981)

Reprinted from RADIO ZS, December 1984

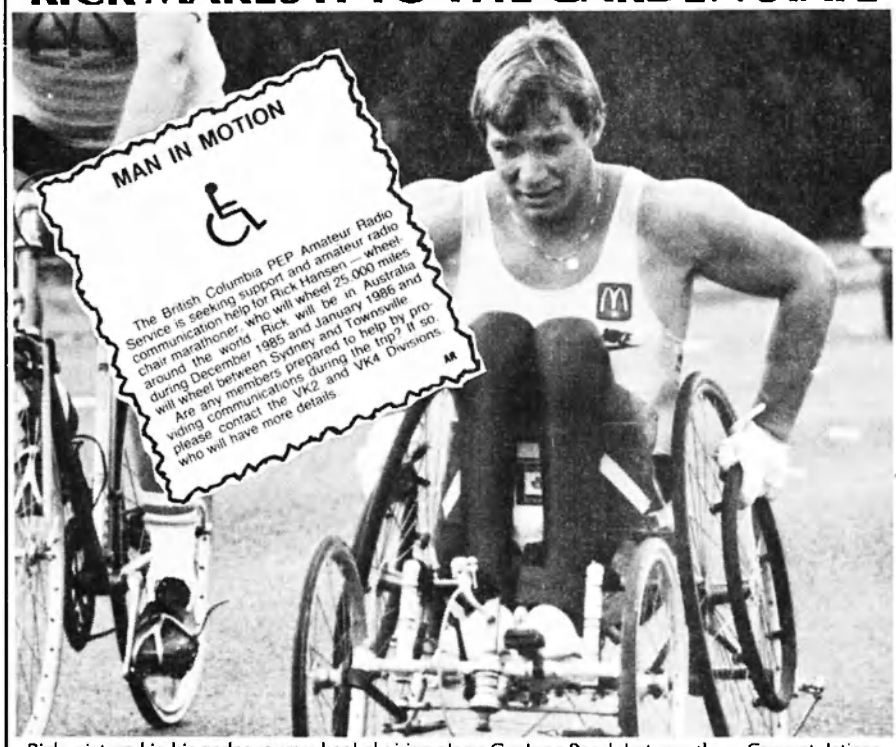
ONE HUNDRED THOUSAND MODEMS

Telecom's Datel Service has reached a milestone with the installation of its 100 000th data modem.

The service began 16 years ago with 200 bits and 600/1200 bits services — today it offers speeds up to 72 kbits.

At the end of the first year there were 565 modems in operation, and Telecom expects the 150 000 modem mark to be achieved in the early 1990s.

RICK MAKES IT TO THE GARDEN STATE



Rick, pictured in his endeavours wheel-chairing along Geelong Road, last month. — Congratulations Rick.

See page 60 – August AR.

Courtesy Herald & Weekly Times Pty Ltd

THE VOYAGE OF ST JUPAT

On 26th September 1985, on the 150th Centenary of the Hungarian Ship Construction Industry, two young Hungarians, Jozsef Gal and Nandor Fa, one a boat-builder, the other a mechanical engineer, left the yacht harbour of Opatija, Yugoslavia, on the shores of the Adriatic Sea, to circumnavigate the world.

The boat SAINT JUPAT, which they built themselves, has an amateur station on-board operating with the call sign HA4SEA/MM, or sometimes with the different prefix — HG4SEA/MM. Equipment is a FT7B (50W).

At the time of writing this article (7th January), they were sailing toward Capetown, South Africa, a destination they hoped to reach by the end of last month. There they paint the bottom of the boat and do a general clean-up of the equipment to eradicate the salt. Their journey will then take them in an easterly direction across the Indian Ocean to Sydney. They anticipate to arrive in Sydney by the end of March, or early April.

They intend to spend some time in Sydney to recuperate from the long trip, and to re-supply the boat.

After Sydney, they will sail to New Zealand and the various Polynesian Islands in the Pacific before returning to Europe in about two or three years.

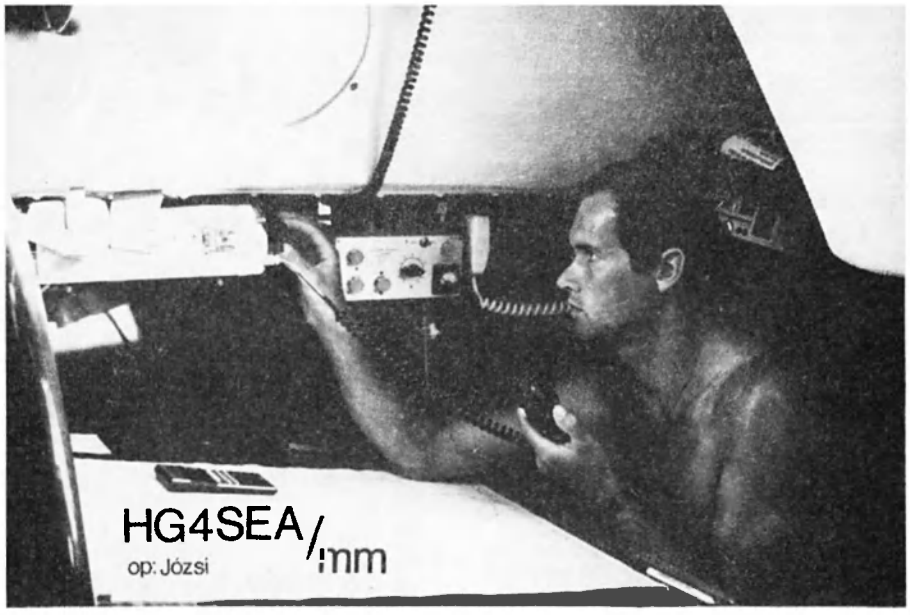
Whilst at sea, they have regular scheds with various Hungarian Amateur Radio Clubs, among them HA4KYN. The times and frequencies of these scheds are: *Daily on 3.660MHz at 0530UTC and 7.040-7.050MHz at 1030UTC. On Mondays and Thursdays at 1030UTC either on 14.260-14.270MHz or 21.260-21.270MHz depending on propagation. Times are approximate.*

'After their regular scheds they will be looking for contacts with other amateurs for a general exchange of news and information, and especially reliable weather reports.

Information supplied by Stephen Pall VK2PS. Additional information and photographs supplied by Lajos Nagyvati HA5DW and kindly forwarded to Amateur Radio by Ken Stevens VK5QW.

AR

HG4SEA/MM.



Above

Jozsef tuning for stations on the FT7B. He is hoping to keep in contact with his wife Judit, via the Club Station HA4KYN. The maritime radio is to the right of Jozsef's hand.

Below

Nandi measuring the Coastal Radio Station's locational direction near the coast of Tristan da Cunha Island (ZD9) where they will have an eyeball QSO with Andy ZD9BV and his XYL Lorna ZD9YL.

Did you know ... In 1855, the Sydney and Parramatta railway line became the first Government operated railway line in the world!

TRY THIS

Merv Smith VK2ZD
1 Bridge Street, Lane Cove, NSW. 2066

CENTRED HOLES

To avoid having your holes drilled off-centre due to the drill wandering, engage the point of the drill with the centre-punch mark and turn the handle backwards once or twice before commencing to drill.

Doing this widens the punch-mark so that the drill sets into the mark accurately, and is prevented from cutting into the side of the punch-mark creating a new centre point and causing the finished hole to be off-centre.

POLAR RADIO — 1912 style!

No radio equipment had been invented which could have helped Captain Scott's ill-fated Antarctic Expedition. In this article, the author looks back to what was probably the earliest experiment in polar communications, with its first test taking place on the very day Scott reached the South Pole.

Tony Smith G4FAI
1 Tash Place, New Southgate, London, N11 1PA, England

Sir Douglas Mawson, leader of the expedition.

Sir Douglas Mawson's Australasian Antarctic Expedition left Hobart on 11th December 1911, to explore hitherto unsurveyed areas of the Antarctic coastline. They established Telefunken 1.5kW wireless stations on Macquarie Island in the South Pacific, some 850 miles (1 368km) from Hobart, and in Adelie Land, Antarctica. A further station on the Shackleton Ice Shelf, 1 500 miles (2 414km) to the west, was to be equipped with wireless for receiving only.

The story of the installation of these stations in a hostile environment, and the struggle to achieve and maintain communications, provides a fascinating picture of the state of radio in those times.

FIRST TESTS

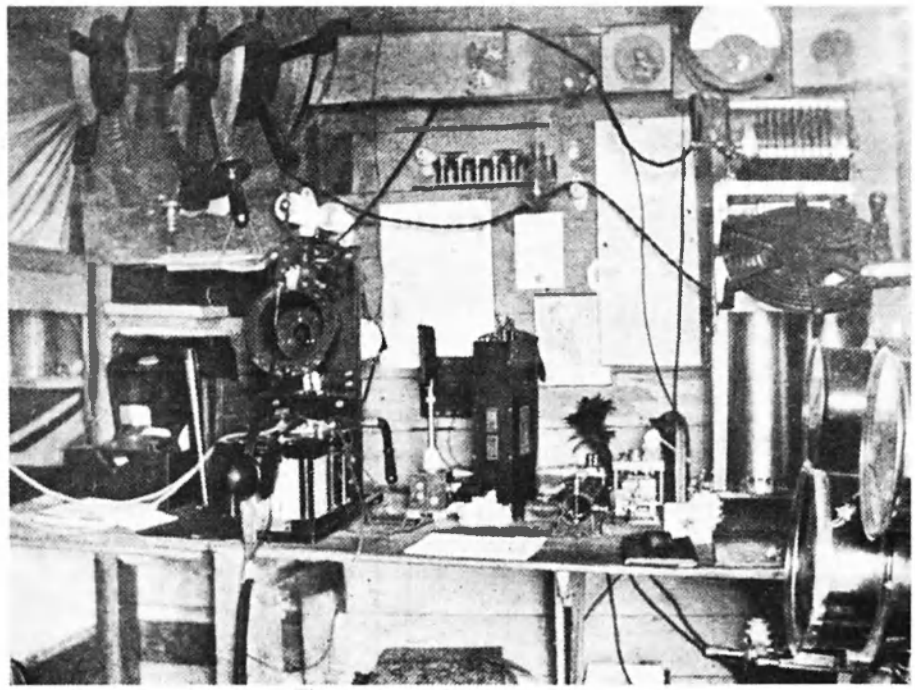
The Macquarie Island station was located on a 300 feet (91m) high flat-topped hill with an open northerly aspect (to Australia), plus, hopefully, a good 'set-off' south to Antarctica. The peaty, wet ground was expected to provide a good earth, and the height of the hill allowed a shorter mast, 90 feet (27m), than would otherwise be required. The only apparent dis- advantage was the need to manhandle the masts, petrol engine, induction generator, dynamo, and other equipment up the steep hill from the beach.

On 17th January 1912, the day Scott reached the Pole, the first tests were made, and signals were satisfactorily received in another part of the island. On 2nd February, Wellington, New Zealand, was heard calling Suva in Fiji, and three days later, as a taste of things to come, a howling gale brought the newly erected aerial down. After another two days, the wind abated and it became possible to climb the mast, re-erect the aerial, and tighten the stay-wires. On the 13th, contact was made with a ship, the SS ULIMAROA. The following night Sydney was worked, together with three ships, one of which, HMS DRAKE, sent useful time signals.

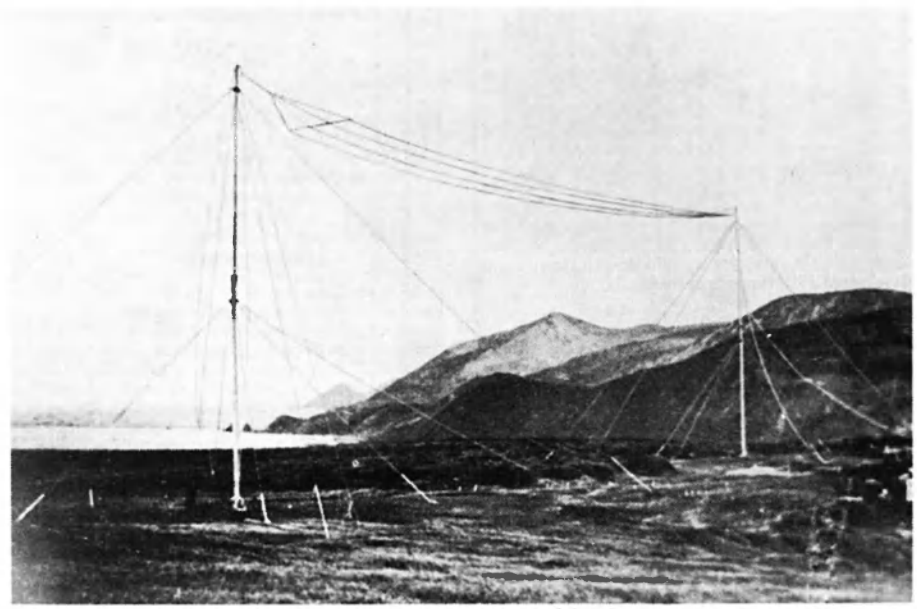
On 10th March, a two-way contact was made with Suva, 2 400 miles (3862km) away, and the next day news was received over the air of Amundsen's successful expedition to the South Pole. Many ships to the east of Australia were now calling at night, but with continuing gales the aerial was in constant danger of collapse, requiring frequent checking and adjustment of stay-lines.

On 1st April, it came down again, and a chain was substituted for the rope which had previously secured it to the mast. The average humidity was 93 percent, and much of the equipment had to be shellacked for protection from excessive condensation.

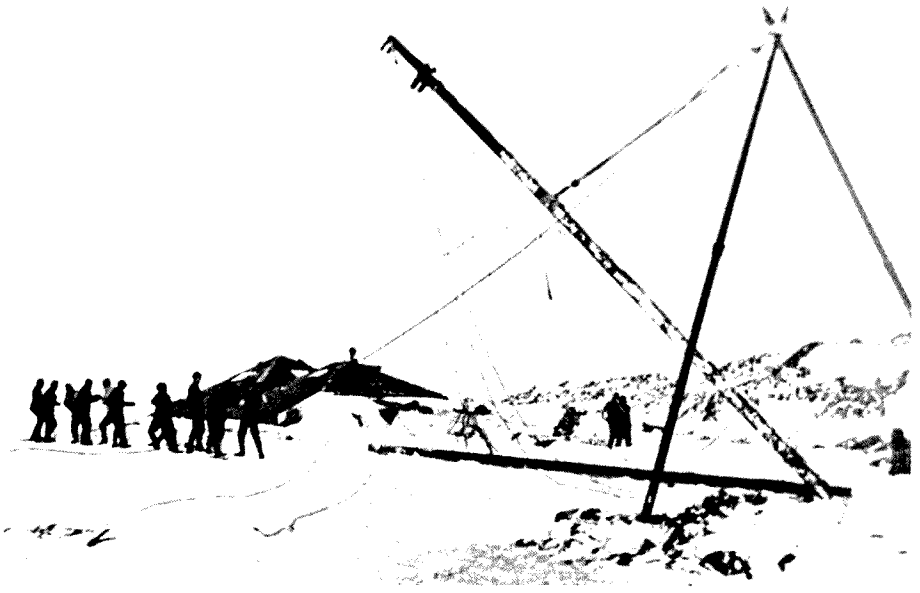
Weather reports were sent nightly to Wellington, 1 000 miles (1 609km) away. HMS DRAKE continued to send time-signals, and Macquarie re-



The station on Macquarie Island.



The antenna at Macquarie Island.



Erecting the lower section of one of the masts in Adelie Land.

transmitted these to Antarctica where they eventually resulted in the fixation of a fundamental meridian in Adelie Land.

ANTARCTICA STRUGGLES

The party in Adelie Land had set up camp in January, but because of blizzards were unable to start erecting their wireless masts until mid-April. Twenty holes were dug in the ice to provide anchorages for the stay-lines. Dynamite was used to clear the site, and to make holes for the three 90 feet (27m) oregon pine masts. These were in sections, which were assembled aloft during many hours work, in 50-60mph (80-96km/h) wind gusts, and in temperatures well below zero. It was August before the aerial could be hoisted between the three masts, whence it was immediately blown down!

By September, all was ready. The engine and the dynamo turned, the note of the spark reached a crescendo, and a message was keyed to the world at large. Disappointingly, the only response was the crackle of atmospherics, and after several days of this, the only progress made was the discovery that, during transmissions, sparks could be 'drawn' from metallic objects in the hut.

Transmissions continued, still without reply, and on 13th October, one of the masts broke in a gale. Since it was now necessary to concentrate on the main purpose of the expedition, exploration of the Antarctic coastline, the aerial was left down, and all wireless experiments ceased.

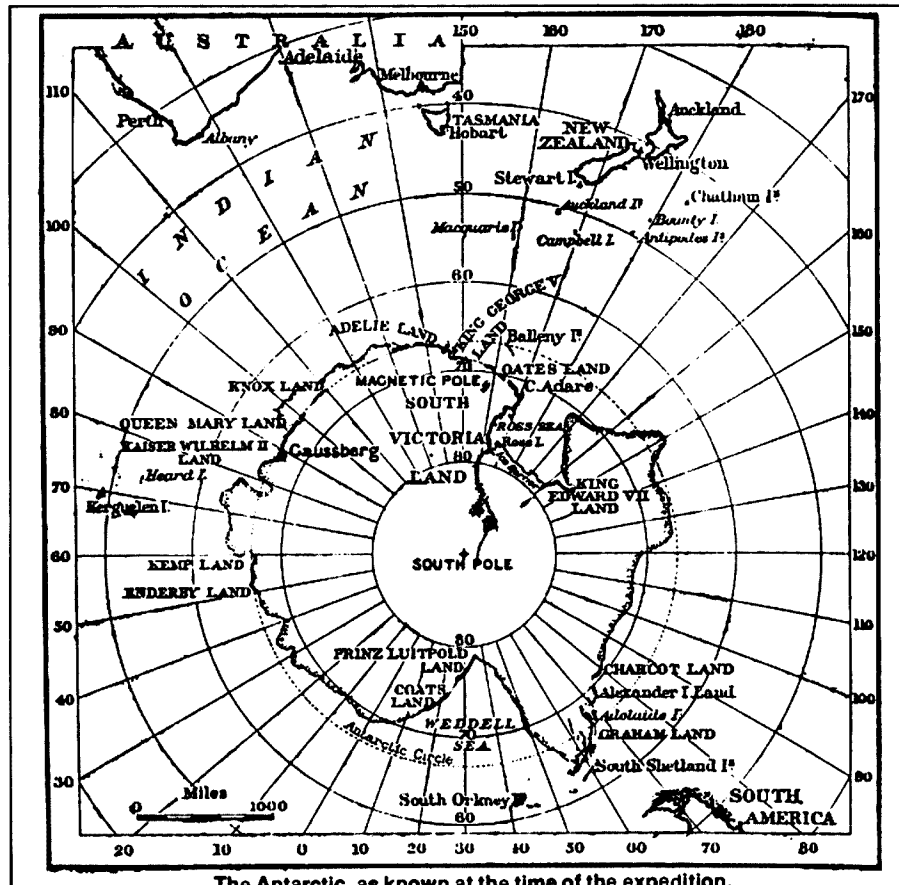
MISSING DETECTOR

In the meantime, the second party, 1 500 miles (2 414km) to the west, were having even less success in wireless terms. Their base was established in February 1912, and the first blizzard they experienced brought both masts down. One only was re- erected, 37 feet (11m) high. It was then discovered that a detector, and other parts were missing, and hope of receiving signals from Adelie Land, and elsewhere, was abandoned.

"HAVING A HELL OF A TIME"

On Macquarie Island, however, wireless work continued successfully. The Pennant Hills high power station, in Sydney, asked for reports on tests it was making. News was regularly received from other land stations, and from ships in the Tasman Sea.

One of the transmissions from Adelie Land was heard faintly on 5th September, *"Please inform Pennant Hills. . . ."* A J Sawyer, the Macquarie operator then called Adelie repeatedly for hours, but without success. On 29th, he heard another call, *"Having a hell of a time waiting for calm weather to put up more masts"*, and 3rd October brought, *"We do not seem to be able to get Macquarie Island; all is well, though bad weather has so far prevented any attempt at sledging"*.



The Antarctic, as known at the time of the expedition.

MISSING PARTY

Equipped with a receiver, but no transmitter, the expedition's ship, SY AURORA, set out in December 1912 to bring back the parties from the Antarctic. Upon arrival in Adelie Land, it was learned that Mawson, and two colleagues had not returned from an extended sledging trip. Whilst the ship waited, the broken wireless mast ashore was re-erected, in case it became necessary to leave a small party to search for the missing men.

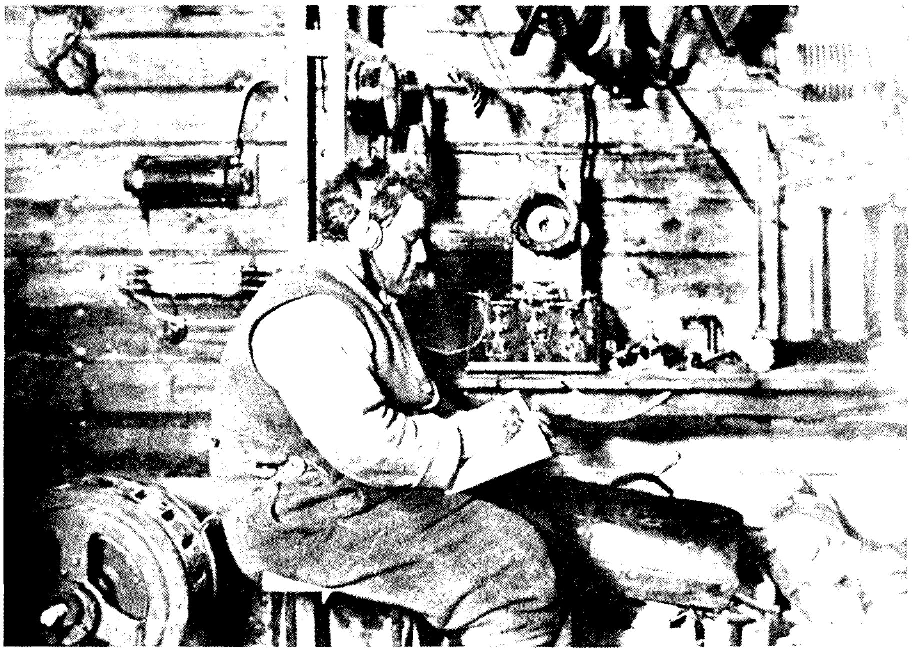
By early February, the ship could wait no longer if it was to successfully collect the western party and not to be, itself, marooned in the winter ice. Shortly after sailing, Adelie Land radioed that Mawson had returned alone, his two companions having perished. The ship turned back, but a fierce gale prevented any landing or visual communication with the shore. Time was now vital, and once again the AURORA turned towards the west.

ADELIE LAND CALLING

With the ship gone, those left behind, numbering seven, settled in for the winter. The aerial was up again, and the operator, S N Jeffryes, was at the wireless every night, calling and listening. On 15th February 1913, he heard Macquarie Island, but was unable to make contact. Five days later, Sawyer, in Macquarie, heard him and responded, *"Good evening"*, whereupon a Leyden jar broke down, and contact was again lost.

Later in the month signals were exchanged, and a message was sent, via Macquarie, asking the Governor-General of Australia to seek the King's agreement to naming the land the expedition had discovered to the east, KING GEORGE V LAND. The first news received in return was that Captain Scott, and his party, had died on their South Pole expedition. On 7th March, the King's approval was received by wireless for that part of the Antarctic, lying between Adelie Land and Oates Land, to be named as requested.

The station was now operated every night from 8pm to 1am. Notes were made of the strength of the signals received, the presence of atmospheric static, and intermittent discharges from snow



The station on Adelie Land.

particles — St Elmo's fire — together with fading caused by auroral activity. Listening alone was a demanding task, it was difficult to hear signals through the electrical interference, there was the constant howling of the wind, plus the noise of the expedition's dogs sheltering just outside the hut!

Jeffryes spent entire evenings trying to transmit, or receive, a single message. A week of auroral displays would result in a complete blackout, then freak conditions would occur and traffic would be exceptional. He sometimes heard stations in Wellington, Sydney, Melbourne, and Hobart, and on one occasion worked directly with the latter.

He sent weather reports nightly to Macquarie, which were often received there when no communication was possible in the reverse direction. These reports comprised three meteorological code words, for barometric reading, velocity, and direction of wind. The velocities recorded were so high, (103mph (166km/h) on one occasion), that no codes then existed for them, and new ones had to be invented.

AERIAL EXPERIMENTS

In June, part of the main mast came down, and experiments were made with kite aerials in a steady 70 mph (113km/h) wind. After three falls to the ice a box kite was beyond further use, and two other designs shared the same fate.

In July, the broken aerial was repaired. As rebuilt earlier, it had a centre mast at 90 feet (27m), and two smaller ones of 30 feet (9m), between which was stretched an 'umbrella' aerial with lead-in wires at the centre. In its place, two masts were now used to support an inverted L directional aerial which, in August, as the first signs of the Antarctic Spring appeared, re- established contact with Macquarie Island.

News was then received that the Queen had agreed to the naming of the tract of Antarctic coast discovered by the expedition's western party, QUEEN MARY LAND. On 6th August, Macquarie signalled enigmatically, *"Food done, but otherwise all right"*. Five days later came reassuring news that a steamer was on its way with much needed supplies, and when it arrived, remarks over-the-air indicated that the islanders were having a night of revelry!

In September, when the sea was frozen, communication was maintained with difficulty. In October, when the ice disappeared, wireless signals peaked at twilight, finally fading when daylight became continuous in November. That month, experiments were made with a small receiver mounted on a sledge, using lengths of copper wire run out on the surface of the ice as an aerial. Signals were received over short distances, but not beyond five and a half miles (8.5km).

HOME AT LAST

It was time for the expedition to return home, almost a year later than had been anticipated. The AURORA arrived at Macquarie in November, at Adelie Land on 13th December, and everyone was back in Australia by 26th February 1914. The station on Macquarie Island had proved its worth. It was taken over by the Australian Government, and continued to send meteorological reports to the Commonwealth Weather Bureau.

The expedition had discovered new lands, and had carried out scientific work in the fields of terrestial magnetism, biology, geology, glaciology, tide, and oceanography. Their wireless work was almost incidental to all this, but they demonstrated the potential of radio in polar exploration, despite the fact that in those pre-shortwave days, communication was restricted in the Antarctic Summer to only a few hundred miles, at best.

Their determination and perseverance in establishing radio communication at all was remarkable. In these day of high technology, and material comforts, it is hard to visualise what they endured to get their messages through!

Illustrations from "The Home of the Blizzard" by Sir Douglas Mawson, London, 1915.

AR

JOIN in the fun of the JOHN MOYLE MEMORIAL FIELD DAY CONTEST — 15-16th March but DO NOT forget to send in your log.

PACKET RADIO — THE FUTURE

In an article, 'REPEATERS — THE FUTURE', published in February's issue of 'Amateur Radio, an outline was given of the changes that have taken place in the Federal Technical Advisory Committee since the last WIA Federal Convention. The article continued by giving an outline of two discussion papers on repeaters, one prepared by the Department of Communications and the other prepared by FTAC. This article summarises a paper that has been written on Packet Radio.

Peter Gamble VK3YRP
CHAIRMAN, FEDERAL TECHNICAL ADVISORY COMMITTEE

INTRODUCTION

Packet communication is a recent addition to the many varied modes of amateur radio communication techniques. It is still very much in the experimental stage, with developmental work continuing in many places, particularly the United States of America and Canada.

Packet radio got its start in Vancouver, Canada, in 1979 with the development of a controller and modem by the Vancouver Amateur Digital Communications Group (VADCG). This design soon spread throughout both Canada and the United States.

With the personal computing revolution and the launching of elliptic orbit amateur satellites, high speed data communications around the world via radio became practical. This became the impetus for further development.

A major packet radio research and development organisation soon evolved in the USA, known as the Tuscon Amateur Packet Radio Corporation (TAPR). This group developed its own hardware and software, and has close links with the amateur satellite organisation, AMSAT.

The American group, backed by AMSAT, held several meetings in 1982 which culminated in the agreement to a new communications protocol more suitable to satellite activities. This protocol was accepted by the ARRL in March 1983 as the preferred protocol. The original Vancouver Protocol was modified in 1984 to overcome some of the limitations of the initial version.

Thus packet radio is still very much an evolving aspect of the Amateur Radio Service. This is in line with the aim of the Amateur Radio Service to be a *'self-training, inter-communication and technical investigation'* service. To enable the continued development of this (and other) aspects of the service, minimal restrictive regulations need to be imposed. The activities should generally be able to be carried on within the framework of the existing regulations.

DOC CONCERNS

The Department of Communications, however, had a number of concerns about packet radio. These centred around unattended operation, bulletin boards, and who would be using the facilities. At the moment, unattended operation is not permitted, and the DOC were concerned that active users of this mode would leave their equipment running at times when they were not nearby. As the packet radio techniques require a transmitter to be keyed to acknowledge receipt of a transmission, this would result in a breach of the regulations.

The concern with bulletin boards was two-fold. Firstly, if they were connected to the telephone network, people without amateur radio qualifications could cause material to be transmitted over amateur radio. Secondly, material could be placed on bulletin boards which could be of a nature that, when transmitted over amateur radio, the regulations were broken. For example, it could be material of a 'commercial' nature. An unsuspecting amateur, retrieving this information would cause an offence to be committed.

To minimise these type of problems, DOC were making suggestions such as password access only to these facilities, so that all users could be registered. Further, that all messages had to be vetted to ensure they complied with the rules.

Against this background, discussions started between DOC and the WIA, and with various groups of packet radio enthusiasts around the country. The result of those discussions has been the preparation of a paper, REVIEW OF AMATEUR RADIO SERVICE PACKET COMMUNICATIONS, by the Federal Technical Advisory Committee. This paper looks at the nature of packet radio and its need for regulation, and makes recommendations to the Wireless Institute for consideration, and if accepted, for forwarding to the Department of Communications.

DESCRIPTION AND USES OF PACKET RADIO

Packet communications is a means of transferring information from one computer to another in an essentially error free form, with a defined protocol. The protocol includes the exchange of positive and negative acknowledgements. The data to be transferred, for example a line of text in ASCII, is bundled up into a 'packet', along with an address and error checking information. This information is then transmitted via radio to another station.

If this information is received correctly at the receiving station, then a short acknowledgement packet is transmitted to the sending station. This allows the next data packet to be forwarded to the receiver. If a packet is received incorrectly, then the sending station is advised, and the original packet is re-transmitted.

The address field usually contains information relating to the identity of the sending and receiving stations. This can either be the complete call signs of the stations involved, or a standard interpretation of the call signs.

The equipment used includes a transceiver, a terminal node controller (TNC) which controls the communication system, an input/output device, which is usually a personal computer, and a modem to convert the signals from the TNC into a form that can be handled by the radio equipment.

In addition to the above hardware, software to control the TNC and to enable the input/output device to communicate with it is also required.

The uses to which packet radio are put are limited only by the capabilities of the radio and computer installations at each end of the link. The following examples indicate some of the potentially wide range of uses.

* *Point to point written communication.* Although this is similar to RTTY, it is enhanced by virtue of the 'store and retrieve' capability. Thus the recipient does not need to be reading the incoming message as it arrives, as the system will automatically 'store' it. The message can then be 'retrieved' at a convenient time.

* *Distribution of 'text' files such as newsletters, articles etc.* These can be prepared 'off-line' using a word processor package, and then distributed 'on-air' as appropriate.

* *Transfer of computer programs.* By providing an essentially error free communications mechanism, large programs in both source code and binary formats can be transferred easily and reliably.

* *Emergency communication capabilities could be enhanced by the use of packet radio techniques.* This would be especially so where lists of names and addresses and other similar information had to be transferred efficiently and accurately.

* *Digital transmission stream for coded analogue information.* For example voice, slow scan television pictures, and facsimile etc.

* *Bulletin boards, for the distribution or exchange of information, new techniques etc.*

* *Shared use of 'network' resources.* Such as high quality printers, extra computing power etc.

* *Remote monitoring and control of unattended facilities such as a voice repeater.*

Although the application of packet radio communication is mainly local at the moment, it is spreading overseas as more stations become involved in the techniques. Overseas contacts have been made via satellites and via direct HF contacts.

PROTOCOLS

The development of software and protocols used in amateur packet radio networks has been influenced by several factors.

* Existing, proven commercial standards should be used wherever possible, making only those changes which are necessary to allow operation in a half-duplex shared channel radio environment.

* The informal nature of amateur radio precluded against protocols requiring a central control site for access control and address assignment.

As indicated in the introduction, two separate protocols have been developed, the first in Canada and the second in the USA. Both protocols are based on standard High Level Datalink Control (HDLC) frames and are loosely modeled on the CCITT X.25 packet switching standards. The main differences occur in the address field formats and error recovery procedures.

The Canadian protocol is usually known as the Vancouver Protocol after its city of origin, while the US protocol is known as AX.25, after the CCITT packet switching protocol X.25, which it is claimed influenced its development.

Each packet transmitted contains various types of Information. This information includes synchronising, addressing and control Information, as well as the actual 'data' being exchanged.

Various types of Terminal Node Controllers (TNCs) have also evolved. Some TNCs will handle only one protocol, while others have been designed to handle more than one. The balance between hardware and software also varies, making some TNCs easier to modify for new developments than others.

UNATTENDED OPERATION

Repeaters and beacons are the most usual form of unattended operation encountered in the amateur service. However, packet radio by its very nature, expands these requirements. In addition to the more obvious need for this capability in conjunction with a repeater, it also forms part of the operation of a normal packet radio station.

In order for the receiving stations TNC to confirm the reception of a packet of information, it is necessary for it to key the transmitter and send

an appropriate acknowledgement packet. To ensure that the transmitter is not keyed on for an excessive time and thus 'disable' the packet channel, it is necessary to incorporate fail safe watch-dog timers. These are usually implemented in both hardware and software and disable the transmitter should it not reset within a specified time.

While voice repeaters are normally located on the highest site around, the experimental packet repeaters are currently located in home or club premises. This is necessary because of the care that the sophisticated computer systems require. Further, such computer systems are normally associated with other facilities such as information storage and retrieval systems.

The most common form of unattended information storage and retrieval systems is the 'Computer Bulletin Board'. These are common in the United States and becoming increasingly popular throughout the rest of the world. Currently there are a number of these in Australia connected to the telephone network.

The computer bulletin board is designed to simulate a cork pin-up board, typically located in a community or library facility. A person viewing such a board can look at the headings of various messages left by others under a number of subject headings. Selected messages can then be retrieved and read in detail, and new messages can be posted. However, a computer offers the ability to set varying degrees of access so that the privilege of posting a message can be given to only a few people. Reading the messages can also be selective — some messages being read by all users, others being read by entering a password. This allows the owner of the system to control and vet the way it is used.

The least privileged access, 'Visitor Access', can be available to everyone, while an authorised user would need to be independently registered, supplying various details for this process, such as their name and address.

It is considered that a variety of uses should be permitted forms of operation for amateur packet radio stations. However, various classes of licence may be required to cater for these types of operation.

RESPONSIBILITIES

The regulations that govern the amateur service have always allowed the amateur to develop and construct equipment to meet his needs. These regulations have prescribed the general technical requirements, but have not made any comment on the specific designs to be used. It is believed that this arrangement can be appropriately extended to packet radio.

Further, the regulations have always clearly laid down that the responsibility for the content of a transmission is always with the transmitting station. All transmissions, or groups of transmissions, are required to be identified by call signs and some form of log is often required.

Again, it is believed that this arrangement can be appropriately extended to packet radio. All packets transmitted contain call sign information, enabling the originator to be identified. Further, all remote use facilities, such as a bulletin boards can be logged, with all essential information recorded.

While it is likely that the operator of a computer system might review all the messages before allowing them to be posted to a bulletin board, this should not be essential providing the user is appropriately identified, and the incoming transmission logged. Thus the originator of any material which is not permitted to be exchanged via amateur radio can be clearly identified.

It is therefore proposed that there be no restriction of access, by password or any other mechanism, for devices that extend the range of amateur transmissions, such as repeaters. However, it should be necessary for the operator of a computer system with bulletin board or other store and retrieval system to log and identify all incoming messages on such a system.

As the number of packet radio stations increases, and as stations are established to provide repeating and computer access capabilities, it is likely that networks will be formed. Again, no objection should be offered to this providing all stations are appropriately licenced.

It is noted that a number of computing systems already exist with connections to the telephone network. If such a system were to be connected to an amateur radio packet station, it could allow the general public to have access to the Amateur Radio Service privileges without having completed any qualifying requirements.

Accordingly, it is suggested that, where any system is connected to both a telecommunication network and the amateur service, material originated via the telecommunication network cannot be available for transmission over the amateur radio link.

As indicated in the introduction, amateur radio is an experimental activity. This experimentation should be encouraged within broad guidelines. It is considered that the guidelines presented above, together with the history of self-regulation of the amateur service, will ensure that packet radio will be an appropriate way of continuing the philosophy of amateur radio.

CONCLUSIONS

After consideration of the various issues raised by the development of packet radio communication, the Federal Technical Advisory Committee presents the following recommendations for adoption by the Wireless Institute of Australia:

1 All packet radio protocols which ensure that call sign information is contained in each packet should be permitted, and that no requirements be placed on equipment design except those generally necessary under the existing Amateur Radio Service regulations. This includes both currently used protocols, Vancouver V2 and AX.25.

2 Any amateur radio operator may set up a packet radio station under the terms of his existing licence. Further, such a station may operate in the unattended mode for the purpose of receiving information from another packet mode station providing that suitable fail-safe firmware is incorporated to ensure that the transmitter cannot remain keyed on for an excessive period of time.

3 Any group of amateurs may apply for a licence to establish and operate a range extending or repeater device for packet radio. Such an application should be in the form of a conventional repeater application. No restriction should be placed on access to this facility by appropriately licenced amateur operators.

4 Any amateur or group of amateurs may apply for a licence to establish and operate a station which provides computer resources for other amateurs. Such an application should be in the form of a conventional repeater licence. It should not be mandatory for restrictions to be placed on access to this facility by appropriately licenced amateur operators, this being up to the discretion of the licenced operator. All calls to this facility are to be logged by the system, the information to be recorded to include call sign information and time and date. Further, if such a system is connected to a telecommunications network, then material originated from such a network cannot be made available for transmission over the amateur radio link.

Further, a system licenced under this section is permitted to automatically originate a call over the Amateur Radio Service and deliver a previously lodged message.

If the above recommendations are accepted, both by the WIA and the DOC, then amateur radio operators will be able to continue exploring new frontiers of technology in the traditions established over the last 75 years.

THE NEXT STEP

Complete copies of Issue 1.2 of this paper have been circulated to all Divisions of the Wireless Institute. It is currently undergoing its final refinement, pending its presentation to the 1986 Federal Convention in April 1986. Any comments or suggestions should be made as soon as possible, either to your Divisional Technical Advisory Committee or to FTAC. This will enable them to be considered prior to the printing of the convention papers. It is not until the Convention has considered this paper and voted to accept it, either in part or in full, that it will become WIA policy.

AR

AN AMATEUR HOLIDAY IN LIECHTENSTEIN

Ghis Penny ON5NT
Linesraat 46, B9880 Aalter, Belgium

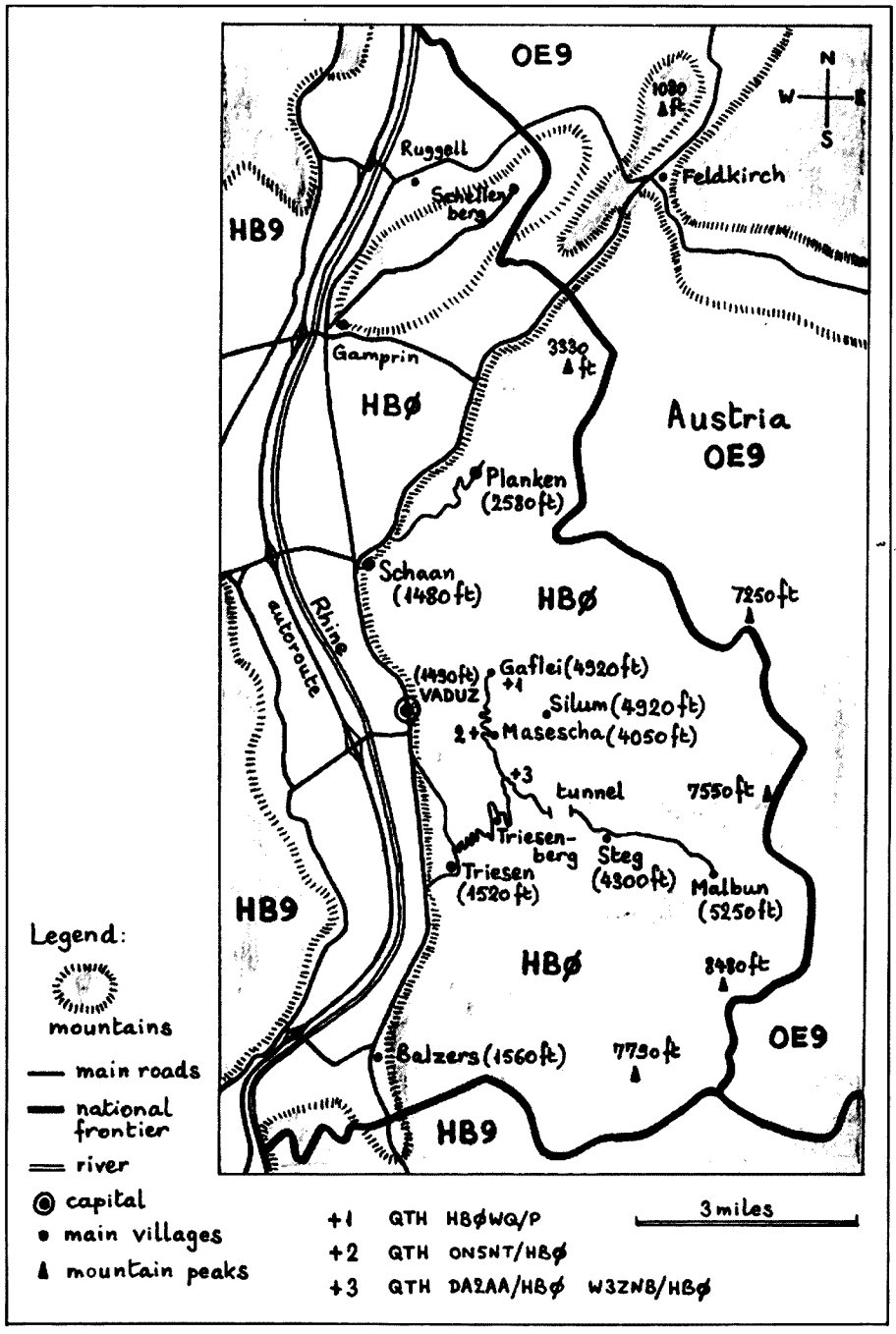
At the end of June 1983 I took some leove to attend Europe's greatest annual amateur "get together" at Friedrichshafen, located on the shores of the Bodenese (Lake Konstanz) in Southern Germany with my XYL Monique. During our stay it was our intention to look for a suitable location for our 1984 annual holidays where we could combine a number of activities including of course, amateur radio.

At the convention, we spoke with Franz DJ9ZB, who has operated as HB0BOE on a couple of occasions, during contests. Franz gave us the address of his contesting QTH in Liechtenstein which was about one and a half hours drive from the location of the convention. At the meeting I received a free licence to operate from DL, OE, HB9 and HB0 with my 2m rig in the car.

Hugo, HB0LL.

En route to the area Franz had told us about, we called in on Hugo HB0LL, and made a telephone call to the land lady that owned the holiday houses, making an appointment to see them and getting further directions. On arrival we were shown what was available and Monique and I decided on the adjacent house to the one that Franz used, as it would be more suitable for the children.

Our holiday QTH. To the right, Franz's holiday retreat.



The principality of Liechtenstein, 158 square kilometres in area, came into being in 1719 and now has a population of some 26,000. Since 1806 it has been a sovereign territory under the Princes' of Liechtenstein, with its own parliament and government. In 1924, it accepted the customs jurisdiction of Switzerland and the Swiss franc became HB0's official currency. As Liechtenstein is integrated into the Swiss economic system, there are no longer any custom check points between the two countries. Topographically, this country is pre alpine in character and enjoys a very mild climate.

Ghis ON5NT, on the outskirts of the village of Malbun.

There are many hotels, alpine resorts and holiday chalets in and around Masescha, Silum, Gaflei, Steg and Malbun. Rambling in the lovely woods on the hillsides and in the mountains provides you with all the exercise and relaxation one desires on a holiday. Attractions are almost unlimited, going from museums, art exhibitions, historical buildings, castles but above all an unspoiled and well cared for idyllic countryside, no grimy industry, a good potent wine and beautiful stamps!

A view of the Rhine valley. On the left HB0 and the right HB9.

The surrounding countries of this principality are Austria and Switzerland. The border of HB9 and HB0 is made by the river Rhine in the Rhine valley.

Getting a licence in HB0 is very easy and fast. Your application must arrive thirty days prior to your intended stay and I had my request back in ten days. One must use their own call sign /HB0.

THE HOLIDAY!

The bookings were made for the 17th July 1984 and as our destination was about a twelve hour drive from my QTH in north western Belgium, we made an overnight stopover in southern Germany and continued on the next morning under a very dark and overcast sky. We arrived in Vaduz, the capital of Liechtenstein, which is about 450 metres above sea level, around 1100 hours local. Just outside the capital we started to climb and at Triesen, 460 metres ASL, we started to ascend to the Alps. It took about 45 minutes to accomplish the twelve kilometre drive to our destination Masescha, which is 1230 metres ASL. The higher we got the more fog we ran into and when we arrived we could barely see the house.

As soon as we unloaded the car, and since the weather wasn't conducive to go walking, it was a good excuse to put up the antennas. Seeing the house before was an advantage as I made a small wooden support to suit the roof and had allowed myself sufficient co-axial cable and wire to erect the antennas. When dusk descended with the fog still present I was ready to come on the air with dipoles for eighty and forty and a 12AVT trap vertical erected next to the house. The location gave me a nice take off for radio signals but I was cut off in some directions by the steep mountains rising to nearly 2000 metres. This resulted in no propagation at all to Asia, VK (short path) and very little propagation to the USSR.

The next morning when we arose, the snow covered Swiss mountain tops in front of us on the other side of the Rhine Valley glistened in the sun, and the fog had completely disappeared. The weather was beautiful and it stayed like that for the next eight days. In the mornings we relaxed and in the afternoons, long walks were taken into the mountains. This worked well with the propagation as twenty metres was at its best in the morning except for some African and South American stations. Fifteen and ten metres didn't open at all for any DX during our stay.

I had just started my first operation on fifteen with some Europeans, when my attention was drawn to a very strong SSB station 20 kHz down from my operating frequency. Soon I found that I had an amateur neighbour, Hugo HB9WQ, who was also spending his holidays, together with his family, in the Alps. His QTH was located on the same mountain side as we were, but about 300 metres higher. Hugo was QRV as HB0WQ/P. This QSO was the first of many that we had on various bands during our vacation and an "eyeball" sched was set up for the Sunday morning.

Hugo HB0WQ/P's QTH.

My friends from the Chiltern DX Club in the London area had asked for some 160 metre activity and I spent a morning putting up two eighty metres dipoles sloping down from the mountainside above the house, to the lawn in front of the house.

Being of a curious nature our next walk took us up towards Hugo's location. The QTH was found easily because of the wire antennae, a dead give away, but Hugo and the family were out and we would have to wait to meet them as arranged. The access to his QTH was very steep and virtually inaccessible by car, a credit to his driving ability. His QTH incidentally was close to the hotel in Gaflei where Martii OH2BH, operated as HB0AZD in the 1976 CQWW CW Contest, one of, if not the best, position in HB0 to operate from.

In the evening I made my first contact on 160 metres, quite an experience as I was new to this band. Prior experience had been a few contacts as ON5NT/IT84, earlier in the year, during the IARU Region 1 conference. The first one to make it into the log was Roger G3KMA, followed by a number of Europeans. A number of W's were heard but unfortunately not worked. (This band is still not allowed in Belgium.)

NEW NEIGHBOURS!

Early in the weekend we gained new radio neighbours, Pat DA2AA and Allen W3ZNB, who had come over from Munich for a weeks operating and were staying at the QTH of Klaus DL7NS/HB0 which was about 300 metres from us on the same altitude but with a "mountain" between us. Klaus is quite active and his multicolour card of the area is known world wide.

L to R: Allen W3ZNB/HB0 (ex VP5M) and Pat DA2AA/HB0 — K7VAY, (ex K4FXT, TA2CA, KH6GOV, HS2AKP and C31UI).

Mid Sunday morning as arranged, Hugo and his family arrived and both families seemed to have so much in common that we decided to have lunch together at a cosy restaurant in Silum, with a beautiful view of the Rhine valley. If one had stepped off the terrace the wrong way they would have fallen about 200 metres.

After an ice cream for the XYL's and the children and a beer for the OM's, we started to walk into the mountains, enjoying the exceptionally beautiful and

Hugo, HB9WQ-HB0WQ/P.

Pat DA2AA/HB0 and Allen W3ZNB's QTH.

rich flora and breath-taking views of the valley. Hugo had taken his 2m hand held with him and after a couple of CQ's was answered by Hans HB9CFD/M. Hans with his XYL were enroute to Liechenstein. The call sign sounded familiar to me and my question of 'had he been QRV in Sri Lanka' brought a positive response. He had been 4S7OM and 4S83OM, a special prefix for WCY in 1983.

Hans HB0CFD also HB9CFD, DF5UG, 4S70M and XYL.

Hans had crossed the border and we made an appointment to them in Silum, 1500 metres ASL, in about one hour. A very enjoyable "eyeball" QSO took

L to R: Standing XYL HB9WQ, HB9WQ, XYL W3ZNB, Monique XYL ON5NT, W3ZNB, XYL DA2AA, DA2AA. Sitting Myriam and Maggie (Harmonics of ON5NT), Heidi.

A view of the holiday homes.

L to R: Ghis ON5NT, Hugo HB9WQ and Hans HB9CFD.

place high in the HB0 Alps. We had to part and Hans continued to climb to Malbun and we descended back to our cars where it was decided that we would visit the visitors from Munich who Hugo hadn't met as yet.

What normally would be a 5 kilometre trip. Hugo, who knows the area better than his home town of Zurich suggested a shorter route by using roads classified for use by "special mountain-cars". These were roads that you only look straight ahead on and in a short time we had spotted the beam antenna and were announcing ourselves by a CQ call on the horn of the car.

We had a very pleasant amateur get together and all agreed that the propagation was not being very kind on the higher bands and July wasn't the best month to visit in a radio sense. Al and Pat after our visit, decided to lower the beam so that they could elevate the 40 metre vertical and get some better contacts by concentrating on that band.

The week progressed and on the Friday morning, the day before we were due to leave, I decided to rise early (0430 UTC) and try the low bands. It was very foggy outside, similar to the weather when we arrived and on looking out the front windows, I saw five deers enjoying their breakfast. A fascinating sight.

Prior to closing down on 40 metres just after sunrise I worked ZL4BO and ZL2ANR, who were putting some nice signals in on SSB. Now was the time to shorten the legs of the dipole for 30 metres and make a few more Europeans happy with a new country. I had already worked a few with the 40 metre dipole but the SWR was a little too high for comfort.

In the afternoon it was time to sadly dismantle the antennas so that we could leave early next morning. Next morning as it happened it was raining very heavily and I was glad that I had given up my last evening of operating.

L to R: Hugo HB9WQ and Hans HB9CFD.

Ghis, with the equipment.

The trip home turned into a nightmare, as the holidays had just started in France. Fourteen hours of hard driving and passing through 6 DXCC countries, HB0, OE, DL, F, LX and ON we were home. With our visit to HB9 during our stay we had worked from seven countries in less than twice as many days.

The log was a disappointment with only 820 QSO's and 80 different countries. The very few VK's worked, all on SSB, were VK's 3DWJ, 3OM, 2HD, 6YF, 2EBX, 4VR, 7GE, 1WW, 6VB, 1WB, 2DLB, 2LX and 9NS. The interesting DX on 80 metres using the TS830S and an inverted "Vee" dipole and Alex CE8ABF on Tierra del Fuego, Gustavo CE0ZIJ on Easter Island and Tony LU3FFD and a few of his friends in Argentina. Some "goodies" on the higher bands were ZD9CC, YI1BGD, 3X4EX, ZD7CW, VP8AXJ, HK0HEU and the Desecheo DXpedition HI3RST/KP5.

During a stay in nearly every holiday chalet, one is kindly invited to put down a story regarding their stay in a guestbook. Looking through the several books, going back into the sixties, we found some very familiar call signs of amateurs that had operated before from the same QTH and had honoured the book with their radio story and QSL card.

It is hoped that this story has given you an insight of a holiday and amateur operating from a nice little country, hidden in the mountains, where you still find an untouched and very much taken care of, beautiful nature. Next time you talk to a station in HB0 you can ask what the exact QTH is, hi!!!

AR

BILL CLEANS OUT HIS SHACK

Ted Holmes VK3DEH
20 Edmunds Street, Parkdale, Vic. 3195

Bill Blitheringtwit, acting under orders received from his better half, had decided it was about time he cleaned out his shack. He stood in the doorway and stared at his little room. He had to admit it was appalling. But, on the other hand, it was no worse than others he had seen. All the same, there was no way of getting out of it this time. He had received a clear and unambiguous instruction that unless something was done about it the room would be permanently locked up and the key thrown away.

He decided he would start where he was standing and so he went out to his yard and fetched in a big plastic dustbin to hold the things he was throwing away. Near the door was a huge pile of magazines. He sat down and started to read them. Some of them dated back to 1930. He read quietly and was still living in the old days, when a loud commanding voice called him out for lunch. So far he had done absolutely nothing.

He returned later and continued reading, occasionally tearing out a wanted page or two and throwing the remainder into the rubbish bin. Pretty soon it was filled to the top and far too heavy for Bill to lift. A brilliant idea struck him. He would fetch in his old trolley.

So out he went and, after rescuing the trolley from the back of a shed, where it had lain for years, wheeled it into the house. His wife did not see the long scratch he made on the side of the fridge as he went through the kitchen, but she did notice the twin black tracks across the kitchen floor. Passing down the hallway, Bill managed to get a couple of vases before he got to his den. The trolley was a bit wide, but he forced it through the door and somehow got the overloaded rubbish bin aboard.

Slowly he laboured the unwieldy contraption through the doorway, causing more scratches to the door frame, and made his uncertain way down the hall. Another ornament bit the dust and by this time his wife was now in a fury. As Bill wheeled she began to scream at him and beat on his back with her fists.

In the area of the lounge the wheels of the trolley got caught in a rug and he was sent off balance. There was a moment's crisis as everything started to go. The rubbish bin fell over and the papers spilled across the floor. Bill sat heavily on his posterior and, as a final touch, the trolley fell clean in the middle of a flower display his wife had completed only a few hours before

With the torrent of invective raging round his ears, Bill reflected on his plus and minus philosophy. All this was definitely a minus situation. But it had a plus side to it. Maybe it was a message to the little woman that shack clean-ups should not be carried out too often — if at all!

AR

POWER LINE INTERFERENCE NOISE AND AMATEUR RADIO RECEPTION

I wanted to write this article because it is my last chance to use the VI prefix. When this article is printed I will be a VK again. I surely enjoyed the 75th festivities using the VI call sign on paper and on the air. Now to this article.

Sam Voron VI2BVS
2 Griffith Avenue, Roseville, NSW. 2069

For years radio amateurs have had mixed success in tackling the Power Line Interference (PLI) problem. Sometimes a continuous source of interference was identifiable by a DOC inspector and he would request electrical authorities to look at the fault. Other times the detection of intermittent and or multiple sources was so time consuming for authorities that we either stopped complaining or switched off.

Another alternative is to do the detection yourself. Using an ultrasonic detector kindly loaned to me by Eddy VK2ZJ, of Kiel Electronics in Sydney, I was able to locate 88 sparking insulators on 34 power poles within 500 metres of my home station. The ultrasonic detector works on the principle that sparks create ultrasonic noise. Using this hand-held device one aims for the greatest noise and then identifies it's source through a pair of built-in sighting holes. This study was conducted at all hours of the day and night over a one month period; 19th February-19th March 1985.

WHY SHOULD AMATEURS LOCATE PLI SOURCES?

Because authorities would not have the resources to spend one month conducting such time consuming field studies.

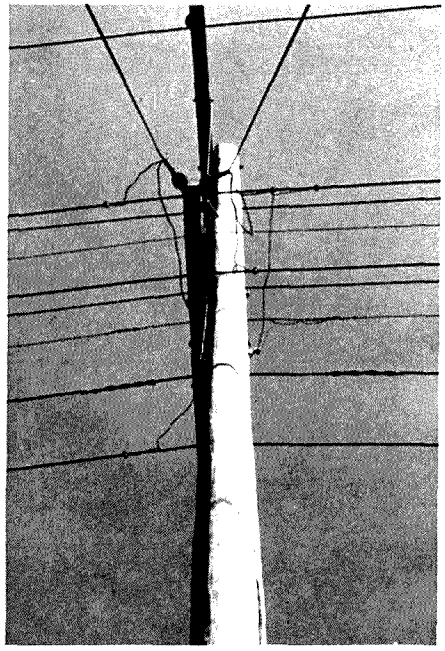
IS PLI NORMAL?

During my study I found that around sunrise, or during wet weather, or on cool windless days no Power Line Noise (PLN) exists from 1 to 200MHz. Thus no sparking across insulation would seem the normal state of a correctly functioning 11kV power system. This was confirmed by three visits by DOC inspectors, who could not find any interference coinciding with their visits. At these times there was no PLN on my amateur radio. My equipment is as sensitive as the best receiver and aerial system typically used by radio amateurs — if PLN were normal it would certainly be capable of picking it up 24 hours a dayl However, it was mainly on windy days or during dry periods of several days that one or more of the repeatedly identified troublesome 34 power-poles with 88 separate identified sparking points caused interference to broad sections between 1MHz and 200MHz. There were other poles which were never found to spark or produce PLI.

My study showed that where there is no sparking in PL hardware there is no noise of PL origin detectable by my equipment (TS930S transceiver, TH7DXS 20, 15, and 10m, 40Z Beam for 40m and ¼ wave slopers for 160 and 80m). 11kV power lines run along the front of our block, but whenever there is sparking this shows up as broadband PLI affecting amateur radio, FM broadcast or frequencies depending on which sections of the range 1 to 200MHz the PLN generating resonances are affecting. In these cases the PL is acting like a spark gap transmitter where the metal parts of the pole (cross arm pin, bolts, insulator pins, nuts and conductors) form the inductive part and the wood and porcelain represent the dielectric of the capacitive part of the interference generator. The spark indicates insulation breakdown or an electrical discontinuity in conductor functions such as corrosion. Eliminating sparks removes current transients which generate the interference producing RF energy.

WHO PAYS FOR FIXING PLI?

From an annual income of, say $20 000, any radio amateur is willing to spend a small percentage on fixing interference caused by his equipment.



The Loose Nut and Metal Support seen on the Top Cross Arm which carries 11kV. The Bottom Cross Arm carries 240V. The sparking is detected under the three nuts holding the Top Cross Arm Insulators. The effect of the Loose Nut on the Metal Support is the Resonant Frequencies which the Spark Current will trigger.

Equally, one imagines that electricity authorities, with their income of millions of dollars, would be willing to spend a small percentage to rectify similar problems. Enormous public relations and goodwill can be gained by electricity authorities when, like radio amateurs, they take an interest in reports of interference and act as soon as possible.

WIA, DOC AND ELECTRICITY AUTHORITIES

From discussion with DOC Headquarters, Canberra I understand that Interference affecting reception of amateur radio, TV or radio broadcasts is treated equally. There is in each case equal concern and equal resolve to reach a solution. There is agreement that, where amateur radio is the cause of interference and thus responsible, so too if PLN is the cause of interference to amateur radio, electricity authorities must rectify the problem.

Electricity authorities generally will not accept interference reports unless they have been checked by DOC. Because it is impractical to duplicate a one month study, as in my case study, I am suggesting that where interference from intermittent multiple PLN sources occurs to amateur radio that state DOC accept advisory reports by WIA appointed PLI investigators. This is possible under the new Radio Communications Regulations.

WILL STANDARDS FOR PLN LEVELS HELP?

DOC has not yet adopted standards in relation to PLN.

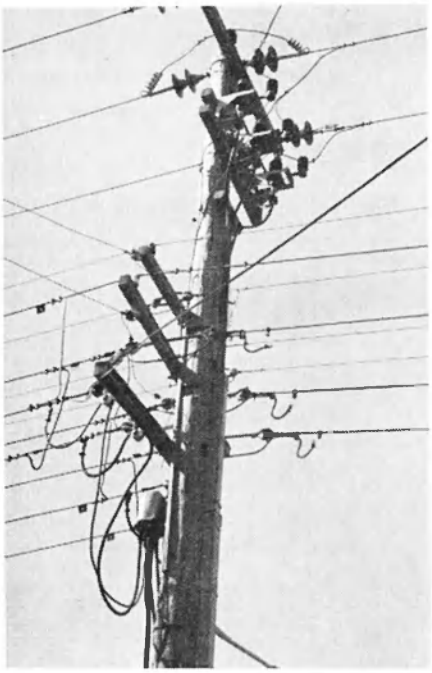
Henry W4PZV, in 73 magazine February 1980 says *"Fortunately for all of us in the United States, there are no minimum limits established for radiation of interference from overhead powerlines. Had there been a minimum level established, we might have had to live with it, no matter how disruptive it was."* The US FCC considers overhead powerlines to be an 'incidental radiation device'. FCC Rules Section 15.25, Part 15 states "an incidental device shall be operated so that the radio frequency energy does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference." FCC Rules Section 15.4(b), Part 15 define harmful interference as "any emission, radiation or induction which seriously degrades, obstructs or repeatedly interrupts a radio communication service".

AMATEUR RADIO RECEPTION

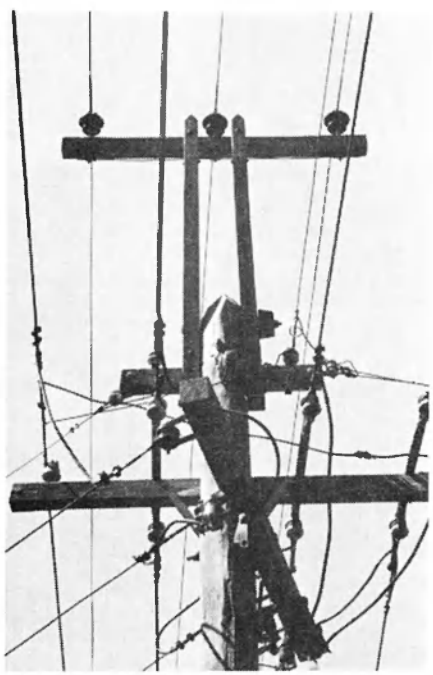
Prior to my study outlined above, I directly requested the electricity authority to remove, from outside my front yard, a pole-mounted transformer which emitted S9 noise on 1.8MHz. The transformer was revamped and returned to the pole some two years ago. I have had no noise since on 1.8MHz. Now my problem is to contact those USA 160 metre operators who keep telling me they just hear someone calling under their S6 noise level. I never imagined that the S-meter could read zero on 160m.

Transformers normally cause only low frequency noise. Noise on frequencies between 4MHz and 200MHz is most likely due to sparking in overhead high voltage lines, 11kV up. There are always exceptions to these trends. Since everything is connected along PL systems one can be led to the wrong conclusions as PLN can propagate for several kilometres. I remember having to run down the road and kick a pole to make the noise stop on 7MHz — the pole had loose nuts and bolts. Noise would wipe out my reception on 14, 21 and 28MHz when a whole row of poles

The Transformer which was replaced two years ago outside the VI2BVS QTH. In addition, all nuts and bolts were secured when the Transformer was revamped, and no problems have since been observed, especially during the intensive one month case-study. It is expected that a tightening of hardware, or cleaning of Disc Insulator Metal Parts and/or tensioning will cure the PLN at this case-study.

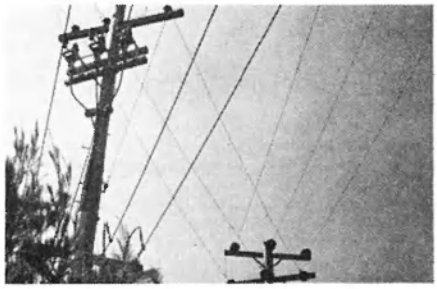


The Top Cross Arm shows the Double Disc Insulators which often lack tension. The Cross Arm below these shows the Underground Cable to Overhead Lines passing through the Insulator sitting on a metal base. Noise can be detected wnere the cable enters this Insulator. The Stand-off Insulator Is a Lightening Arrestor.



The Loose Staple and Bonding Wire under the three Insulator Nuts. PLN emitted from these three Nuts holding the Insulators on the Top Cross Arm carrying 11kV.

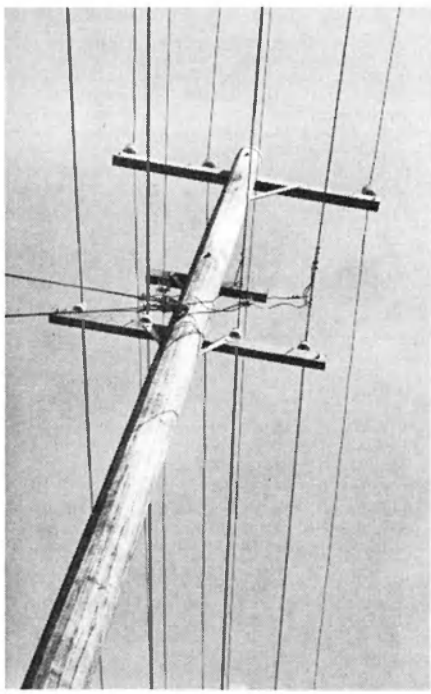
would spark between the rusted nuts and insulator pin and shorting wire holding three 11kV insulators. 7MHz to 200MHz would display noise as double disc insulators sparked across their corroded or loosely tensioned joints. Particularly savage (S9+) was the noise even at 52 and 144MHz when underground to overhead insu-



Disc Insulators at Dead End Pole. Notice how loose the three bottom power lines are. In fact they can be seen swinging in the wind and heard sparking on the Ultra-sound Detector.

lators sparked. You can appreciate the delight of days with S0 noise levels when you are usually subjected to the frustrations of such interference conditions.

I detected sparking only on 11kV lines, none from the 240V lines. Several times neighbours would ring suspecting it was me causing dots on their Channel 0 and 2 television. When I turned up in their homes they would say; *"Oh, it can't be you, it must be something wrong with my TV set."*



New Construction Single Metal Support with no Earth Strap Bonding Wire under the Insulator pins showed no noise.

ADDITIONAL NOTES

Rainy days often provide a short circuit allowing leakage currents to flow across a junction instead of sparking over. In dry weather sparks can occur at loose points, corroded points or moving points.

Into the field take an ultrasonic detector (sometimes you can even hear sparks by ear), a 27MHz 'Walkie Talkie' without a built-in noise limiter (this is not a good way to track the noise source but will give a rough indication of noise level even though it will vary greatly — it's most important purpose is to tell you if the noise is still occurring). Also take binoculars to note any visual irregularities on the pole hardware, paper and pen and flashlight for night patrolling. The best way to track sparking sources is to systematically check all poles in your area when noise is occurring, then check sources when no noise is heard as extra correlation to the interference. When using the ultrasonic detector you will learn to distinguish between sparks, insect noises and gas or underground water flows. A Tasmanian radio club purchased such a detector and lends it to it's members. Try doing PLN studies through your club, WIA, or DOC because your electricity authority may be unhappy with a seemingly haphazard report. Form a group to combine the skills in your area on this matter. My thanks for providing so much assistance in this project goes to Tony VK3QQ, former EMC coordinator and Eddy VK2ZJ of Kiel Electronics, 26 Gammell Street, Rydalmere NSW 2116.

References provided by Tony VK3QQ included:

"Interference to VHF TV Services from Overhead HV Power Lines." — Monitor — Proceedings of the IREE Australia, December 1978, page 167.

"The Location, Correction and Prevention of RI and TVI Sources from Overhead Power Lines" — IEEE tutorial course, A Continuing Education Service of the IEEE Power Engineering Society, Course Text 76CH1163-5-PWR.

"In Search of Power Line Interference" — how to find it and get it stopped, — 73 magazine, February 1980, page 66.

"Ultrasonic Ear Finds Power Line Faults" — Electronics Australia, September 1979, page 86.

AR

QSP

MORE COMMERCIAL RADIO STATIONS

Remote Australian communities of 200 people or more should have at least one additional commercial radio service later this year.

Communications Minister Michael Duffy said he expected to act quickly to introduce additional commercial radio services once the Forward Development Unit of DOC finished its report on the future of commercial radio, by the end of this month.

Special Enlarged Amateur Experimenters' Section.

RADIO IN AUSTRALIA AND NEW ZEALAND

Ham Notes

Notes from all Districts. Queenslanders' Reply to Criticism.

Vol. 2. No. 3. JULY 16, 1928 *Supplement*

W Felton OA-2RF one of the most consistent transmitters on the air today.

Bill Crawford, NSW Radio Inspector, who is not half so formidable as this picture makes him out to be. He is one of the pioneers of radio in Australia.

W B Crocker OA-2BB, an old NSW amateur, who has just returned from a trip to England and is enthusiastic over the efficiency of British transmitters.

Trevor "Wattle" Watkins OA-7DX, one of the best "fists" in Australia. He now operates on crystal control.

Payson R Gould NU-9DHP, RADIO's NW USA correspondent. His signals are consistently heard in Australia.

Phil Renshaw OA-2DE, Vice-President of the old WIA, a pioneer radio amateur, who is not often heard these days.

Harry Kauper OA-5BG, also chief engineer of 5CL. He was responsible for the Stopwith-Kauper gun mechanism, which enables firing through the propeller field of an aeroplane.

H T Simmons, ex OA-6KX, now 3XK, whose signals are well received. He is returning to Perth shortly, where he will be heard again under his old call sign.

Max Howden OA3BO, one of the first Australians to QSO England on the 80-metre band. 3BO has now recovered from the disastrous fire which destroyed his whole station some time ago.

The above reprinted page was contributed by Peter Alexander VK2PA, and may bring back some memories for Old Timers.

YOUR FIRST WIRELESS SET

WHEN YOU HAVE YOUR FIRST WIRELESS SET INSTALLED FOR YOU—

DO NOT DELAY—

TO TAKE FULL ADVANTAGE—

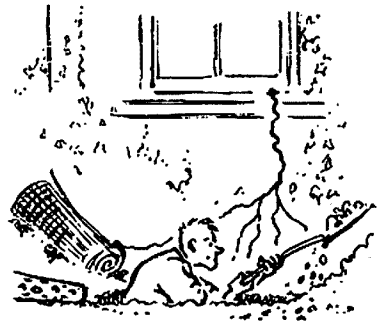
OF ITS ENTERTAINMENT—

FOR ONCE-

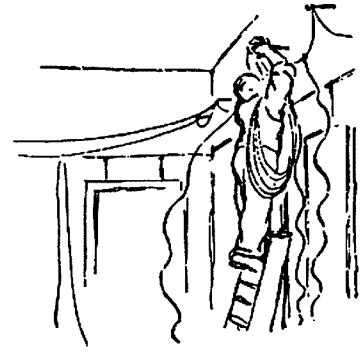
YOU GET

BITTEN—

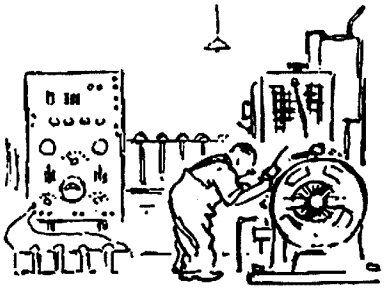
WITH THE SUBJECT—



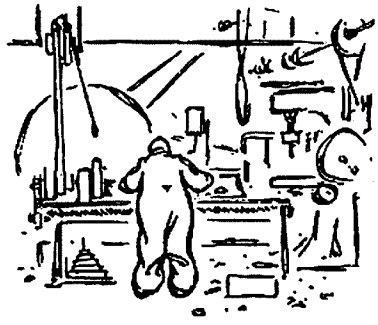
YOU WILL—



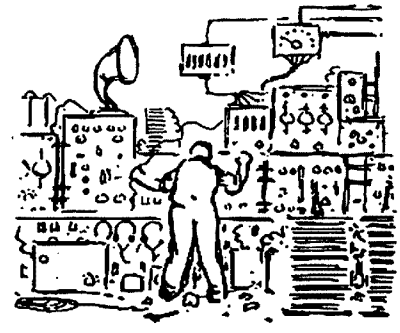
NEVER AGAIN—



HAVE—



MUCH—



LEISURE FOR LISTENING.

Reprinted from PUNCH magazine and contributed by Ivan Huser VK5QV.

SIMULATED EMERGENCY TEST (SET) 1985 & PACKET RADIO REPORT

Sam Voron VI2BVS
2 Griffith Avenue, Roseville, NSW. 2069

The Fourth Annual SET took place from 22nd-24th November 1985. This event allows any Australian amateur radio operator to simulate a disaster, or event, and plan how to provide health and welfare communications to the general public via the daily schedules of the Australian Traffic Network (ATN).

COULD NOT PARTICIPATE

The SET weekend used by the ATN is made to coincide with the Wireless Institute Civil Emergency Network (WICEN) SET weekend. WICEN operators, under their own particular scenario and network, mobilise state, national, or international links, which are normally co-ordinated by NSW WICEN.

This year, NSW WICEN, with its busy schedule, could not participate, and the ATN, only just recovering from the Mexico City Earthquake communications, was also inclined to avoid participation in the weekend. However, having read two articles about Packet Radio for beginners in two QST magazines, a SET combining Packet Radio became an exciting prospect.

QST, October 1985, p64, says *"Packet Radio is hot! It is the hottest thing in amateur radio since the repeater craze of the 1970s"*.

In all three previous SET exercises, the weak point in providing communications has been the international link. A handful of messages have been passed over voice or CW, and then there is no propagation again until the next day. Even during the Mexico disaster hundreds of messages were passed nationally to collecting points but it was then a problem to pass them quickly and accurately overseas. Luckily, with this operation, Overseas Telecommunications Commission (OTC) provided free telephone links between amateurs in Australia and the USA. The US amateurs then relayed the messages, via amateur radio to Mexico City.

LET'S TRY A NEW METHOD

But, what if the next disaster is in Australia and OTC links are affected or not available to some area of the world? Would Packet Radio be the answer for relaying hundreds of messages over small available propagation paths?

So, what is this Packet Radio? Simply, with Packet Radio, numbers, figures, and letters can be entered on a keyboard, ie a computer, and is connected, via a 'black-box', to amateur radio. It may be asked, *how is this different from RTTY Baudot?* Baudot is normally less than 100WPM, but Packet is transmitted faster than 360WPM on HF and faster than 1440WPM on VHF, and it also guarantees perfect reception.

I set myself a project to see if a beginner who knew nothing about computers — I had always completely avoided them — could be set-up for Packet Radio within a three week deadline.

WHEELS IN MOTION

A phone call was made to Packet Traffic Handler, Don NI6A, who suggested a PK64 Black Box between a home computer and amateur radio was all that was needed. The relevant equipment was then ordered from the United States.

The Countdown to SET 85 then began — at minus three weeks the computer arrived. There was then much delving into the manual and many conversations on-air to find out specific meanings.

Minus two weeks — the PK64 arrived and it was back to the manual again. Incidentally, the PK64 also works on AMTOR, RTTY, ASCII, and Morse, but I decided to wait until after SET to read about these operations.

Minus one week and the fast-switching linear amplifier, designed for the increased US amateur power limit arrived.

A second PK64 was available for a one week period over the ATN and was given to John VK2PJB. With only a novice licence, John could not send but could only receive. John is a 14 year-old computer *buff* and he was able to assist me to quickly digest some of the 'ins and outs' as we experimented for three days leading up to SET.

BEACON IN OPERATION

With only the briefest of two-way contacts prior to SET, 0800UTC Friday arrived. The PK64 was set on Beacon Mode and 30 seconds on 14.103.5MHz LSB was selected. Every 30 seconds an automatic message was transmitted — *"VI2BVS Beacon Sam in Sydney, Australia. Welcome to the Australian Simulated Emergency Test"*. If anyone called me (and you can have more than one QSO on Packet) the PK64 would then *automatically transmit* the message *"VI2BVS Beacon — Please leave simulated welfare message in ARRL format, then disconnect. Thank you"*.

Stations from all over the USA lit up my TV monitor with Beacons, Bulletin Boards, Mail Boxes, and CQ Calls — it was like watching a high adventure on television. LA6OCA, in Norway, said he was the only Packet Bulletin Board station in Europe and this was his first contact with Australia! We communicated for about an hour.

AIMS OF SET

The three aims of SET are —

to find out our strong points and limitations in providing emergency communications. SET provided me with the incentive needed to get Packet operational at my station. Others activated the now familiar 28.500MHz Emergency Preparedness Sydney Traffic Net check-in frequency, which SET has helped to establish for quick activation in time of emergencies.

to help amateurs gain experience in communicating, using standard procedures under simulated emergency conditions. Many checking into the VI2BVS Beacon were not familiar with traffic handling or the ARRL format. Packet allows details of such standard procedures and formalities to be sent quickly.

to provide a demonstration to members of the public (this is normally the ATN function) and to serve agencies such as Red Cross, Civil Emergency Authorities, Salvation Army, etc (this is normally WICEN functioning) and of the value to the public of amateur radio, particularly in time of need. Australian Associated Press (AAP) was contacted and details of the simulated energy crisis scenario, composed by Martin VK2PJW, were released, with an invitation to members of the public to visit VI2BVS's shack to see amateur radio and SET in action.

Linton, a 14 year-old studying for his amateur licence and a helper during the Mexico City Earthquake, and I kept the automatic Packet Beacon company during the night.

PLENTY OF PUBLICITY

During SET, Radio 2KY, in Sydney, with Dave VK2NH, well-known amateur and news-reader at the mike, carried several news items about the event. SET concluded at midnight on Sunday.

AAP released a story Australia-wide to all newspapers, radio, and television, of how radio amateurs and a home computer, together with the Mexico City experience, were being used to develop an even better emergency communications service for the public. AAP were particularly interested in any details of further up-coming amateur radio events.

Packet Radio allows one station to be relayed through another Packet station on the same frequency. This is called Digipeating. One of the next experiments developed from this SET experience is to set up a 124.103.5MHz Packet station in the middle of a shopping centre and, in a simulated disaster, have the VI2BVS home station, with directional aerial, beaming the USA digipeat the signals. subject to DOC approval.

One of the American experiences has been the usefulness of using two home computers operated by two teams. One to maintain the Packet link, the other to be involved with the actual welfare message storage onto disk, using disk drives. This would be useful, although for this first SET exercise one computer was used to perform both functions.

More information on traffic handling and related experiments and tests can be obtained by participating on the following daily third party traffic networks.

AUSTRALIAN TRAFFIC NET (ATN) at 0930 UTC on 3.570MHz +/- Novice Phone Section.

WEST AUSTRALIAN TRAFFIC NET (WATN) at 1100 UTC on 3.620MHz +/- QRM.

AUSTRALIAN AMERICAN TRAFFIC NET (AATN) Primary at 0030 UTC on 21.415MHz. Secondary (if needed) at 0400 and 0500 UTC on 14.285MHz. Also 0800 UTC on 7.228MHz.

INTERNATIONAL ASSISTANCE AND TRAFFIC NET (IATN) at 1130 UTC on 14.303MHz .

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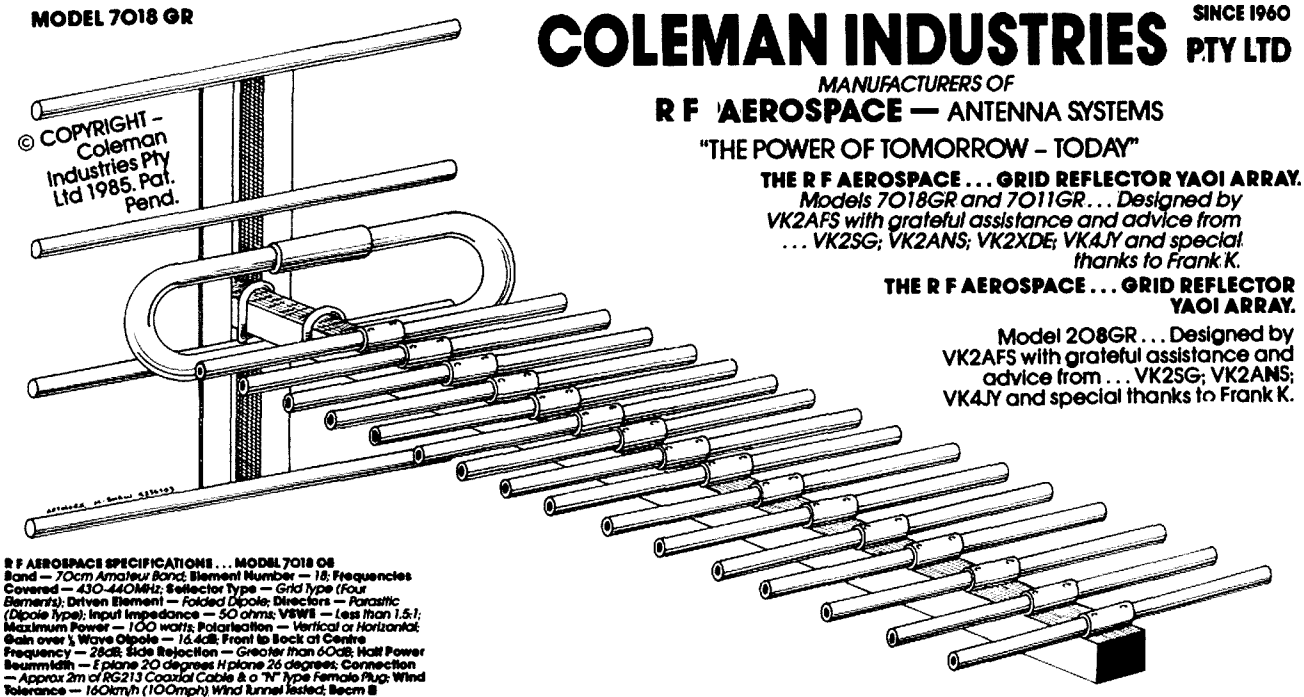

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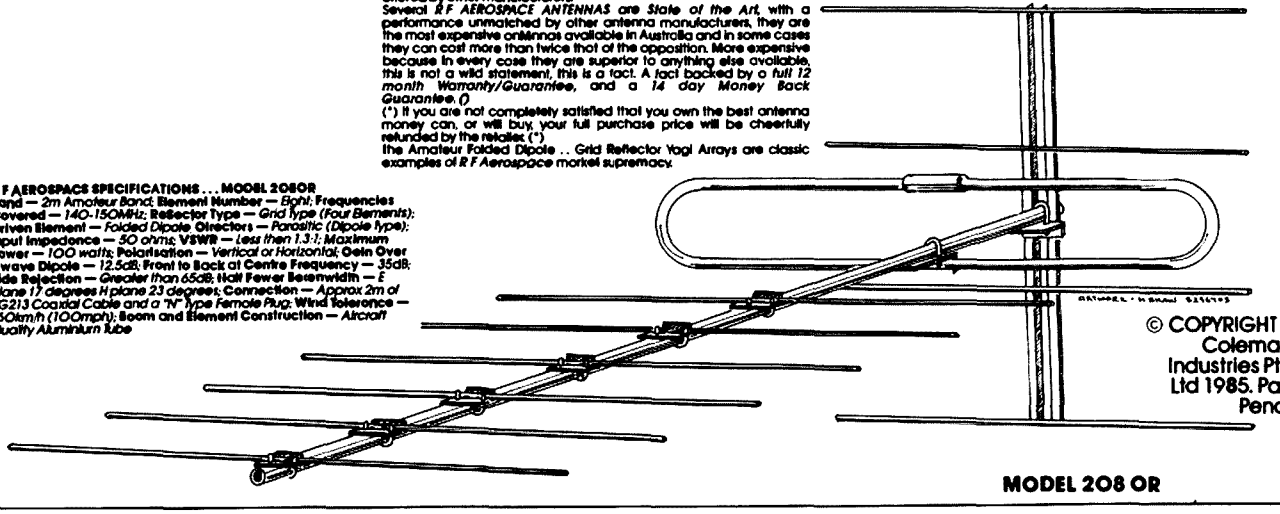

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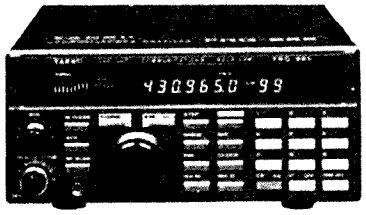

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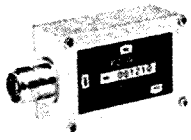

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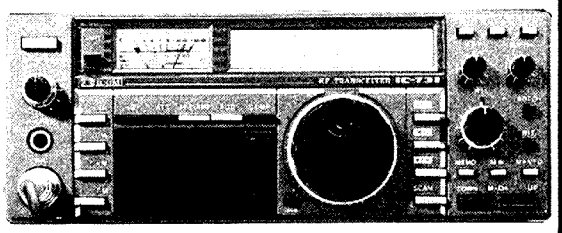

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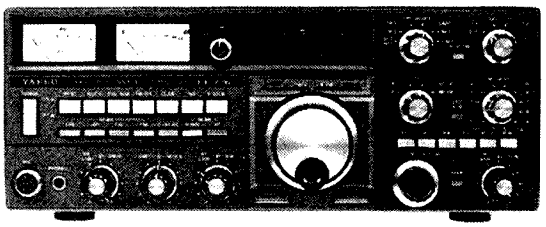

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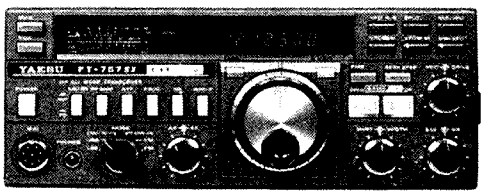

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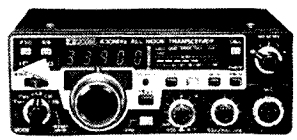

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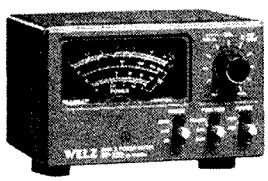

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50.010	JA2IGY	*Mie*
50.020	JA6YBR	*Japan*
50.060	KH6EOI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Japan*
51.020	ZL1UHF	*Mount Climie*
52.013	P29BPL	*Loloata Island*[1]
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.325	VK2RHV	*Newcastle*
52.370	VK7NST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.470	VK7RNT	*Launceston*
52.490	ZL3SIX	*Blenheim*
52.510	ZL2MHF	*Upper Hutt*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.465	VK6RTW	*Albany*
144.480	VK8VF	*Darwin*
144.550	VK5NSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.460	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

(1) The P29BPL Beacon is definitely on 52.013MHz as I heard it several times during December and January. Previously, there had been a query as to frequency.

(2) VK0MA has been deleted for the time being as Mark VK0AQ will be returning home on the seventh of this month and its continuing operation is in doubt for the moment.

(3) VK3RMB, on 432.425MHz, has been deleted for the present, while being repaired.

SPORADIC E IN 1985

Under that heading last month I asked *"Just how do you describe what has so far happened on both six and two metres, up to 21/12? . . . there hasn't been anything quite like what has happened on six metres and so consistently for quite a long time"*. The same heading could again be applied, with even more emphasis, for the period from 21/12 to early January 1986. Over and over again the comments could be heard on the six metre band in particular, that such an Es season had not been observed before by so many. In 25 years on the band, I do not know of a better period and those on the band for 35 years and more are saying the same thing! The range of contacts has been incredible, the whole of Australia and New Zealand, and some parts of the Pacific being worked day after day, with the band open for probably 24 hours at a time. I have come into the shack around midnight local time and had contacts, on one occasion with a New Zealand station, and his local time would have been after 2.30am! He said the band had not closed, so why should he?

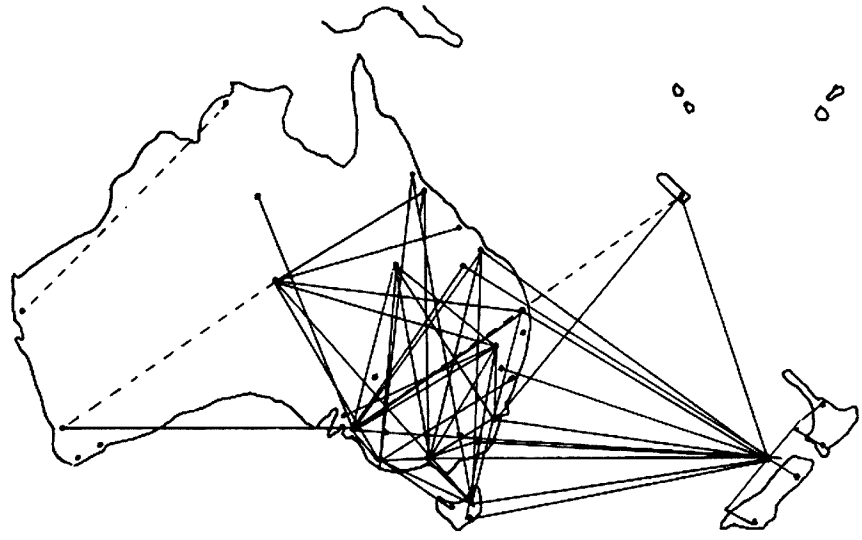
Such outstanding performances have not been limited to the six metre band. Two metres has given the greatest performance of all time — that is a sweeping statement, but a true one! In a matter of a few hours, it has been possible, on at least two occasions, to work VK2; VK3; VK4; VK5; VK7 and VK8 from VK5, mainly from Mount Gambier, but that is still VK5! Six States on two metres and being heard in New Zealand as well in one day. Hardly believable. Contacts have extended from Townsville to Tennant Creek in VK8; Alice Springs was heard in VK6; down through VK5 to Adelaide and Mount Gambier; all through Victoria; down to Tasmania (who also worked ZL on two); up through New South Wales and back into Queensland. More than half of Australia being involved in the one day. In addition, VK2 at least, plus ZLs worked a string of FK stations in New Caledonia on two metres, most of whom were only 10 watt mobiles.

As I write these notes at night on 15th January, two metres opened again over much of the eastern half of Australia around 0730, with stations being heard (and some worked) from VK 1; 2; 3; 4; 5; 8 . . . and ZL! VK5s ZDR; RO; ZBU; ZWP and AEI at least worked Brian ZL1BHX around 0800 to 0825 when the band closed. I was having my evening meal! I believe the last recorded contact on two metres between VK5 and ZL was the one establishing the record for VK5 between VK5BC and ZL2HP on 23rd December 1965, a distance of 3149km. Unless there are other VK5s further out who worked ZL then the distance record may well shift to VK5ZWP at Warradale which is one of the suburbs of Adelaide.

Congratulations to those who where around to complete the contacts — it shows you still need to be vigilant and around at the right time. Col VK5RO mentioned it was necessary to move the antenna around to the various VK States for contacts to be made as there were so many stations on that strong signals were necessary to be heard! This opening over such a wide area, even greater than at the end of December, adds the cream to the cake for Es operation this year and it may not be finished yet, it is still only the middle of January as I write these notes, so who knows what might happen in the next few days.

For several years now I have been advising operators to be ready for greatly increased Es during the low part of the cycle (1985 and 1986) and exhorting them to watch out for two metre contacts. I now feel my words have not been wasted, the results speak for themselves. It has been a truly remarkable Es season and will be a great fillip to keeping VHF alive. It shows there are still plenty of people around prepared and able to work two metres SSB when the occasion merits, despite the inroads made into the usage of the two metre band by FM and the repeaters.

I wish to thank Trevor VK5NC, Colin VK5DK, Brian VK2AKU, Joe VK7JG and Peter VK8ZLX who have been kind enough to send me copies of their logs for the period around 1st December 1985 to 7th January 1986 which has enabled me to do several things which could be of interest to



This map indicates the spread of two metre contacts during late-December 1985, between Australia, New Zealand and New Caledonia. To stop crossing lines into New Zealand all contacts have been indicated to a central point, which could mean any one of the four ZL call areas. The dots around the Australian coast-line, starting from North Queensland and going clockwise are for Cairns, Townsville, Rockhampton, Mackay, Brisbane, Byron Bay (blank), just inland is Narrabri, Taree, Sydney, Canberra, Melbourne, Mount Gambier, Adelaide, Port Pirie, Esperance and Albany (blank), Perth, Carnarvon and Darwin at the top. In the centre is Alice Springs and above that Tennant Creek. Longreach is in Central Queensland and Springsure/ Emaraid is further east towards Rockhampton. The dotted lines indicate signals heard but not worked. Tasmania shows Burnie in the north, Launceston and Hobart towards the bottom. Noumea (New Caledonia) is the island in the Pacific with lines drawn to it.

readers. In conjunction with my own log I have been able to establish the following:

ON SIX METRES: *From the six logs I have there have been at least 402 separate call signs from VK1 to VK8 inclusive, comprising seven in VK1, 83 in VK2, 124 in VK3, 72 in VK4, 54 in VK5, 28 in VK6, 17 in VK7 and 17 in VK8. Of the 402 stations there were 218 full calls, 128 limited calls and 56 K calls or combined limited and novice.*

ON TWO METRES: *There are 168 call signs for this band, comprising three in VK1, 26 in VK2, 87 in VK3, 24 in VK4, 28 in VK5, three in VK6, nine in VK7 and six in VK8. Of these there were 102 full calls, 43 limited calls and 11 K or combined calls.*

Of course everyone knows there are a lot more stations around who had plenty of contacts on both bands so perhaps we could safely say somewhat over 500 calls were on six metres at some stage and over 200 on two metres. A lot of calls worked both bands too, but it does indicate a quite high degree of interest and activity on these VHF bands. A lot of contacts were made on 70cm too, and on several bands higher than that by some, but for the moment comment is being centred on 52 and 144MHz.

In addition to the above VK stations, on six metres there were 13 stations signing ZL1, 22 for ZL2, nine for ZL3 and four for ZL4. Also noted were H44GP, 3D2CM, FK1RF, FK1TK, FK1TD, FK8EM, FK8FA, FK8AX, P29BH, P29QA, YJ8RG, ZM8OY, VK9LC, VK9LM and VK9ZB, a total of 15 stations in the Pacific areas.

The VK5LP log comprises more than 400 contacts on 25 days between 1/12 and 15/1 on 52, 144 and 432 MHz. Areas contacted include VK1 to 8, VK9LC, VK9LM, VK9ZB, ZM8OY, FK1, FK8, YJ8, H44, P29 and ZL1 to ZL4, all on six metres. On two metres areas included VK2, VK3, VK4, VK5, VK6 and VK8, with VK7 heard but unable to make contact. I did miss out on ZL1BHX on 15/1 but hopefully there will be another time, and I see no reason why 1986 should be much altered for Es contacts from 1985.

It appears to have been a year when VK6 has not been able to share in the very high degree of activity. They appear to have missed out on Es contacts on two metres all the other states have been sharing, and there is a suggestion they may have missed out on some of the six metre activity. One of their problems, due to isolation, is that when signals are so strong from such a vast area of the eastern States the VK6 stations also need to be very strong to be heard through the mass of signals from some hundreds of stations all using the band at the same time and largely congregated in the first 100 kHz or so. Also, with so much two metre activity and the need to make sure of the beam heading for two metres, and with most antennas on the same mast, it seems logical to expect eastern States antennas would be turned less to VK6 this year than normally, hence a drop-off in contacts for them. So while we may all be saying what a great year it has been, those in VK6 may not necessarily agree.

The accompanying map may give some idea of the spread of two metre activity. It is rather hard to convey a total picture with only black and white, but the map covers the period *from* 26th December 1985 to 5th January 1986, with the following details: 26/12: VK2 to VK3, 5, 7; 27/12: VK2 to VK7, VK3 to VK5; 28/12: VK5 to VK1, 2, 3, 4, 5, 7; 29/12: VK5 to VK1, 2, 3, 4, 5, 7, 8; 30/12: VK5 to VK3, VK8 to VK3; 31/12: VK5 to VK3; 1/1: VK4 to VK5; 2/1: VK5 to VK2, 3, 4, VK2 to VK4, 5, 8, VK8 to VK2, 4; 5/1 VK5 to VK2, 3 and VK8 to VK3. Since then on 9/1 VK8 to VK4. Scattered amongst these contact were others between New Zealand and VK1, 2, 3, 4, 7 and VK5 heard, all almost on a daily basis. It took many years to finally open from VK8, firstly to VK5LP and VK5RO on 16/12 and this probably whetted the appetite of the VK8s. On 29/12, Peter VK8ZLX worked eight VK5s and 24 VK3s; on 30/12 he worked six in VK3, and on 5/1 he worked a further nine in VK3. Then to cap the VK8 effort, Neil VK8ZCU, in Tennant Creek, worked Mick VK5ZDR and Jim VK5ZMJ on 7/1.

HIGHLIGHTS AND HAPPENINGS

I do not propose to give a blow by blow description of what has occurred during the six weeks, to the middle of January, all those operating on six metres will be well aware of the widespread openings on both six and two metres, and for every contact which may be mentioned, there will be ten others equally of note. Instead of masses of call signs this time here are some of the more important events as I saw them or were passed on to me by others. My note book runs to more than 15 pages!

At the beginning of December, Ron YJ8RG put in an appearance and he was to feature in many contacts. Also, VK9ZB on Willis Island became known and on 4/1 ZL2TPY worked VK2 and VK4 on two metres. 7/12 was a day for beacons, VK2RSY, VK2RGB, VK2RHV, VK4RTL, VK7RST, VK7RNT, and a couple of ZL beacons, all on six metres. The VK5LP log book for that day shows contacts to YJ8, VK9ZB, VK1, 2, 3, 4, 5, 6, 7, 8, ZL1 and ZL2. Quite a day, perhaps foretelling of days to come! Gordon VK5KAA reported hearing the VK0MA beacon peaking to S9 during the afternoon, a report also came along saying it had been heard in VK2. Mark VK0AQ confirmed the beacon was running at the time. ZL8OY was *off to* the Kermadecs and would soon be ZM8OY and operational on six metres.

On 8/12. VK4ALM carried a report that ZL8OY had already been heard in FK8 at 2230UTC. We also learned that VK9ZB would be ORT from 10/12. Next we heard that FK1TK had already copied ZM8OY on CW at 2200. Lionel VK3NM was off to New Zealand with six metre gear from 22/12 to 18/1; P29BH heard for the first time, and VK3ZBJ worked into VK4 on two metres. First reports of JA sounding signals heard by VK5FT and VK2GP about 52.460MHz, subsequently suggested they were intruding operators from fishing vessels to the north of Australia. VK4HK worked ZL1 and ZL2 on 11/12. Mick VK5ZDR worked ZL2TCK at 1045 on 14/12. This was to be the start of an avalanche of ZLs this season. On 15/12 open to ZL1, 2, YJ8, ZM8OY. VK2BHO reported that it was open to ZL most of the day.

The 16/12 was another great day, which started off early at 2247 with ZL1ADP then VK2KAY who reported FK8s were hearing VK2, 3 and 5 and ZL, and said he had worked ZM8OY on 10/12. As the day progressed, VK8 came in with VK8ZLX and VK8LF S9+, then VK4 who were followed by YJ8RG, then more VK4s and then back to VK8. It was this latter recall which prompted VK5RO to try two metres with Alice Springs, culminating in both he and VK5LP working VK8GF to us WAS on two metres — *at last!* By now, the VK5LP log book was starting to look good! Next came VK2s, then short skip VK3s, back to VK4, then VK2, over to VK6, back to VK2, more VK3s, then YJ8RG again, next VK4 and VK2, then Chris ZM8OY called me for a desperately needed first VK5 contact. I was happy to oblige! At the time (0715) he was 5x5 but, shortly after he was 5x9. *So* that was a new country. More VK2, VK1 and a couple of ZLs to finish a good day!

ZL was open for one and a quarter hours to VK2 up to 0615 and VK2ZMG and VK2YL worked ZL1BHX on two metres. Others to work ZL on two included VK2BA, VK2XJ, VK2ZQA. At 0800, a report was received that ZL had worked FK on two metres.

17/12 was another good day starting up. ZLs were in before the end of the UTC day. ZL2CD worked VK1 to 8 inclusive! At VK5LP, before 0800 ZL1 to 4 had been worked plus VK2, VK4 and VK4ABP had been heard on two metres. At 0656, ZL2TPY worked FK8EM and three others on two metres, VK1 to ZL on two and VK7ZIF grabbed four ZLs, also on two, and was also heard on 70cm. Greg VK7KJ reported bursts of ZL1 and ZL3 up to S5 on 70cm. ZL2TAS reported hearing VK5NC at Mount Gambier on two at 0800, but only for five seconds! While ZL2TPY was working FK8 on two ZL1BHX was working VK4 on two. At 1023, ZL1TZA was involved in a marathon between VK1, VK7 and VK8ZLX at the same time.

On 18/12, ZL to VK2 got the day going on 144.100MHz. Then Chris ZM8OY came on. Plenty of VK2s, so strong in fact that we tried two metres and VK5LP worked VK2XDH and heard VK2KAY and VK2AKU. 20/12 started off with VK2 and VK4 leading up to working VK9LC on Norfolk Island at 0353 with signals to 5x9, despite Nev only being able to operate from his hotel room with 10 watts and a ¼ wave whip! A few short skip VK3s, more VK2s and 4s to end the day. 22/12, had to be content with VK6ZWH 5x8 at 0436, and a report from VK4KAL that the group of people around him, VK4LE, VK4AGQ and VK4LC all worked ZL on 5/12 on two metres which they considered to be as far inland that ZLs had probably been heard. VK4ZWH worked FK8 at mid-day.

23/12 and things started early, VK9LC worked at 0041 to 5x9, short skip to VK3AFN at 0313 5x9, ZL2s around 0340 then VK2. ZLs were now working FK8 frequently on six. JA fishing vessels down as low as 52.250MHz and interfering with the ZL beacon. 0900 FK8EM. Heard Les VK3ZBJ on 144.100 around 2300 working VK5DK. 24/12 was a bit quiet except for VK9LC, ZL4TBN/3, VK6BE, then VK2 and 4. 25/12 Christmas Day and I am getting ready for my portable expedition at Meningie, 100km south east of Adelaide, but noted VK9LC was in again as was ZL1, 2 and 3.

26/12 — Set-up camp at Meningie on top of a good rise, and what a pleasure to get away from power line noise, motor cars, etc. Now within range of VK3 for more 144 and 432MHz contacts. On six VK2, 3, 4, 8, and ZL were worked. P29BPL Beacon heard on 52.013, and I was able to check the frequency. ZL to VK4 on two.

Felt sure that 27/12 was going to be a good day, ZLs pouring in before 2300, with ZL1 to 4 worked, then VK7NC at 0100. VK3DQJ working VK2 and VK4 on two metres. A VK4 reported ZL had been heard in 5W1. ZL1BHX to VK4GC and VK4ZAZ on two. VK5RO reported copying CW from FK8EM on two metres at 2205 for about one minute to S5. VK5ZDR worked VK4ZWH on two at 5x9. FK8EM at 2238 on six metres. VK2AKU to VK7ZAR on two, also to VK5DK. VK3AOS worked FK8EM and VK9LC. In between all this many contacts were fitted-in on 144 and 432MHz to south eastern VK5 and into VK3 from Meningie.

If yesterday was a good day, then 28/12 looked even better. Lots of short skip from VK5 and VK3 on six, and many contacts on 144 and 432 to both areas. At 0038, worked P29BH. Then followed VK1, 2, 4 and 8. But the day seemed to peter out a bit and the great expectations were not realised!

However, 29/12 made up for the day before. At 2322, VK4LE on 144.100, VK5NC worked VK4ABP and VK4YJH around 0015. VK2AKU worked VK7 on two. Around 0300, the two metre band went mad, with VK8GF, VK8ZLX, VK8TM worked by VK5NC to 5x7 and continuing until 0400. At 0422, Trevor worked VK4RR on 144 at 5x4 from near Townsville, then followed a whole heap of VK3s, plus VK7JG (0819) and it was still going at 1133. VK5NC worked VK7DC on 144 and 432MHz. This was the day he and Colin VK5DK worked VK2, 3, 4, 5, 7 and 8 on two metres! VK2AKU worked VK5ZMJ and a string of VK7s on two. VK2RX had quite a day too by working a series of mobile stations in FK1 and FK8 on his hand-held FM rig on 144.100! There were up to five FK stations on at once with signals to 5x9 and running 10 watts. VK2QF reported working VK1 to 9 and ZL1 to 4 plus P29. The two metre opening to VK8 also involved VK5MC, VK5DJ and VK5AXV, who also worked VK4ABP on two. VK4ABP reported working eleven VK5s on two. VK3UM, as well as 144, tried 432MHz with VK8GF, but no results. VK8GB will be leaving Darwin to reside in Canberra this month. VK8TM worked VK7JG on two. VK9LM will replace VK9LC on Norfolk.

30/12 — After such an incredible day yesterday, today must be quieter, but will it be? At 2335 there is VK9LC at 5x9. Then VK6KXW 5x9. He said yesterday was not very good in VK6, a few VK8s late in the day! VK6HK at 0028, then to VK4 followed by FK8EM at 00106 and FK1TD at 0142. Then some ZLs, then VK8ZCU at Tennant Creek who reported not working anyone on two metres, but had heard VK4FXX for one-way only.

However VK8TM, at Alice Springs, worked VK7JG on two. It seems the Alice Springs boys were sharing the first contacts. VK8GF was the first to work a VK5, VK8ZLX the first to work a VK3 and VK8TM the first VK7. Nice to be friends, isn't it? ZL2TPY heard FK8 on two metres during the day. FK8EM reported 23 VK2s had been worked on two metres by FK stations. ZL1BHX apparently worked 3D2CM on 29/12 and Radio Suva on 100MHz was heard in ZL at the same time. VK2BKL worked nine FKs on two metres. Included was the first mobile to mobile contact.

The FM hand-held read the stations to 5x9 at 0000UTC. Gordon VK4WF, running two watts to a two element beam was 5x9 here at 0523. YJ8HG in also. Report from VK6HK that a Perth SWL had received television from Samoal ZLs around 0700.

31/12 and a little quieter today, but VK8GF, VK8TM and VK8KTM all in around 0130 at 5x9. At 0230, ZLs started with ZL2TPY 5x9. Then over to VK2BKL 5x9 at 0243 and followed by VK9LM 5x8, at 0254. Then worked my old friends Lance VK4ZAZ at 0434 and Hughie VK5BC at Berrie at 0446. More VK2s and 4s leading up to VK6HK at 0655. Heard that VK2QF had worked Andy VK6OX at Carnarvon, you can't get much farther than that across Australia. YJ8RG in again, more ZLs. VK8ZCU at Tennant Creek tried two metres with VK4FXX and VK3AMK, but to no avail. VK7JG reported on 27/12 he had a ball on two metres by working six VK2s and six VK4s. Also reported he would be going to Norfolk Island for five days from 29th January 1986 and would have six metres mobile. VK5KUG travelling across the Nullarbor from Perth was hearing Melbourne FM on a ¼ wave whip on his hand-held. Andrew VK3KAJ and others were entrenched on Mount William with 144, 432, 1296 FM and CW, 2304 and 3456MHz CW and would be trying to extend the present record on 3.5GHz.

As a new year dawns (1st January 1985), VK5LP is still portable at Meningie and loath to leave such a good site! VK4FXX in at 0019, then VK8ZLX at 0042, two metres to VK5NC and some VK3s. At 0151, VK6BA and VK6AOM, then VK4s, more VK8s. Had more than 40 contacts today, many of them on 144 and 432MHz to VK3.

The 2/1 sees VK5LP packing up to go home after a wonderful week at Meningie. VK2AKU worked VK4ABP at Longreach at 0750, followed a few minutes later by VK8ZLX, VK8KTM and VK8TM, all on two metres. VK5DK worked VK4AUR, VK4TN, VK2DDG, VK4AGQ, VK2KAY, plus eight VK3s, all on two metres starting at 0820. 3/1 and 4/1 — usual VK2s and 4s plus a few ZLs and VK8ZMA and VK8ZLX, never a day without VK8s.

5/1 — started off with VK8ZCU and VK8ZLX around 0130, VK7ZIF at 0211, VK2 and VK1 at 0300, later VK4ABP. VK5DK worked VK2ZJK and VK2KAY on two at 0400, then VK9LM at 0500 on six. This was immediately followed by YJ8RG. VK2s were working FKs during the morning. On 6/1, the usual VK8s and 4s. On 7/1, Mick VK5ZDR and Jim VK5ZMJ were both rather pleased to work Neil VK8ZCU on two metres, being their first VK8. They had missed the previous openings and they were the only two stations Neil actually worked on two metres for the season. The day started with VK8s again, then VK7JG at 0930, a long short skip opening to VK3 with a dozen or more stations worked on six between 1000 and 1100. At 1113, VK5NC was 5x9 on two, and 5x5 on 432 and VK5DK was 5x8 on 432MHz. At 1151, VK8ZLX was still in. Jim VK3AZY worked Townsville on two while Gil VK3AUI had to be content working Rockhampton on two. ZL2TPY reported more than 800 QSOs on six and two metres and had worked VK1, 2, 3 and 4 on two, also that JA1VOK had heard Channel 0 on that day from 0400 to 0600. FK8s were hearing weak JA signals on both 50 and 52MHz. ZL8OY heard 52.090 running a keyer. Joe VK7JG reported he and VK7ZIF, VK7ZAR and VK7KJ on 28, 29 and 31/12 had worked about 40 stations on two metres in VK1, 2, 4 and ZL. Quite a good score.

8/1 — VK3s working VK4ZWH, VK4YJH and VK4WF on two metres at 0846. The next day or two were quieter, with VK8, 4 and 2, plus some ZLs. 14/1 turned out to be another good one with ZLs and FK8 in the morning, from 0630 VK2 and 4, more ZLs who were so strong that this led the VK5s to try two metres to them with the results reported earlier when five stations worked ZL1BHX, around 0800. At the same time, VK7s were very strong on six, and there were many VK3s on short skip to S9+, which indicated a high MUF. ZLs continued to be around until after 1000UTC, also VK2 and 7. VK2 also worked FK8 on two that same day. VK5RO also reported FK8 and YJ8 this day.

More short skip on six to VK3 on 15/1 but no two metres! ZL1SW (Lionel VK3NM on holidays) 5x9 at 1009, then many more VK3s at 5x9. Les VK3ZBJ reported 8050 points scored for the Ross Hull Contest, and went on to say, possibly with tongue-in-cheek though, that on 1/1, during the big strong opening to VK8ZCU, Nell mentioned he had 10GHz equipment, but no one to work. As Les also had similar equipment, he suggested a contact be attempted, which they did but with no results! Les said at least this was probably the first attempt at a contact between VK3 and VK8 on 10GHz! VK3YTT worked ZL1BHX on FM on 52.015 at 0930. Four stations on from Alice Springs.

Here endeth this part of the epistle! Maybe it is a bit long, but it could have been much longer, 15 pages of notes condensed into two or three columns. I know there will have been many unreported interesting happenings which will eventually surface, but I cannot be everywhere at once and unless I listen all the time and make many more telephone calls and do no operating, then some points will be missed, but overall the above does give a general portrayal of what happened on six and two metres during the Es season of 1985/86, a truly outstanding year and one which will take beating. But I see no reason not to predict that it will be somewhat similar for the 1986 season, as we will still be in the low part of the cycle.

One last item to hand, Col VK5RO on 14/1, following the ZL contact on two metres was involved on six metres in a round-table with ZL1BHX, VK2RX and VK3YTT at 0930, when another station signing W1-25 broke in and added some comments! He left soon after without really establishing who he was, but as they were all on FM Col wondered if he was a CBer trying his hand at six metres!

CERTIFICATES

Following all the happenings on two metres during the past month, it seems very likely there will be quite a few people now having Worked All States on two metres, so the Awards Manager could be busy. The first one went to Steve VK4ZSH a couple of years ago following his wanderings around Queensland when he worked a number of areas. Col VK5RO got number two by hand-delivering his QSLs and beating my posted QSLs, henceforth VK5LP has number three, and Ken Jewell VK3AKK is number four. The Worked All VK Call Areas portion of this award may be much harder to achieve as it will require VK9 and VK0, the latter possibly being very difficult to achieve, but with Macquarie Island offering the best hope, we need an operator down there with enough interest in two metres.

TESTS ON 10GHz

Recent news of 10GHz operation in VK3 has prompted the 'old firm' of VK2BDN and VK2ZAC to dust off their portable crystal controlled gear and venture out in the mid-summer sun.

On Sunday, 29th December 1985, Bill VK2ZAC and Dave VK2IT, travelled to Mount Gibraltar at Mittagong; Dick VK2BDN, with Geoff VK2ZQC found their way to Tumble Down Dick, a high point in the Terry Hills area. The path selected had previously been worked by Des VK2AHC in setting a State 10GHz record and the object of the latest tests were to determine the ease with which the path could be worked. Also, the margin of signal-over-noise with the present equipment.

A two metre liaison channel was used with ground plane antennas at both ends and no difficulty was experienced in establishing initial contact. Using survey maps and compass bearings, 10GHz contact was established at 10am local and maintained for some 40 minutes. After alignment of the antennas, signals were maintained 30dB above the noise threshold with no QSB.

Equipment used was the same at both ends and consisted of:

TRANSMITTER: 144MHz exciter and varactor multiplier to 1152MHz, step recovery diode x 9 multiplier to 10.368GHz. Power output 20mW. Modulation NBFM.

ANTENNA: 40cm (16") paraboloid and waveguide feed, measured gain 28dB.

RECEIVER: Front end diode balanced mixer. First IF at 49MHz, second 15MHz and third 1.5MHz. Fourth IF at 455kHz.

PATH DETAILS: Path length 115km (72 miles). Path loss (free space) 154dB. Signal clearance — the path is clear using earth radius. The only features close to the path occur at Pymble and Top Ryde.

Following the opening contact VK2BDN/VK2ZQC investigated the country towards Commodore Heights; this area proved to be obstructed by an east/west ridge at Terry Hills. As very poor two metre signals were encountered, no further 10GHz tests were set up.

Plans are in hand to try some new paths during the holiday break to again put VK2 on the map!

Thanks to Bill VK2ZAC, who sent in the information and we look forward to hearing further on the exploits of this intrepid gang!

QUEENSLAND

Bill VK4LC writes that up to mid-December he had worked quite a few ZLs on two metres. On 5/12 worked eight ZLs with signals to S9+ and on 16/12 worked seven in ZL1 and one ZL3. Time for all these contacts between 0600 and 0700.

Bill reports his QTH, at Eagle Heights is 609m (2 000 feet) ASL, with a clear take-off in all directions and in particular to New Zealand. This results in the slightly embarrassing position of having to work through pile-ups of ZLs on 144.100MHz! (Personally, I think it is an embarrassment I could well stand . . . 5LP)

Bill operates regularly on OSCAR-10 and the best QSO recently was with TR8JLD of the West Coast of Africa. He has also just received his WAC for SSB on OSCAR-10. The antenna system on 144 is four by 19 elements and 432 is two 19 elements, both arrays at 15m (50 feet). Equipment is an IC-271H and 471H with pre-amps, but no linears.

WESTERN AUSTRALIA

Peter VK6KXW, sent a short report on his six metre activity. On 8/12 he worked FK8EM 5x3 both ways. On 17/12 worked three ZL1s, five ZL2s and two ZL3s between 0549 and 0739. On 24/12 worked two ZL1s, five ZL2s, three ZL3s, between 0736 and 0918. At 1022, worked VK9LC at Norfolk Island, 5x4 out and 5x6 in. On 30/12, VK9LC at 2326 and on 1/1 VK9LM at 0211.

Peter also mentioned the 1st January was a day of intense Es and reports 10-15 minutes of two metres between Phil VK6ZKO and VK5ZAR, 5x5 both ways on 144.100MHz at 0341. Later in the day, the band opened on six to VK8, northern VK4 and P29QA.

In the event that there is some relaxation of the rules in regard to the use of 50MHz now that Channel 0 in Melbourne and Sydney have gone, Peter advocates greater usage of the 50MHz end of the band to put us in the same area as other parts of the world but conforming to the standards and frequencies already in use by other areas. I am in general agreement with this, but would rather defer comment until something definite appears on the books. In the meantime, the other relevant points he has raised on this matter have been filed away until the appropriate time.

GENERAL NEWS

CQ ham radio from Japan, per courtesy of VK6RO, mentions reception of a Russian AM radio station on 50.610MHz, on 28th July 1985, and again on 13th August 1985. Areas worked in their summer Es season (our winter) included HL5, HL1, VS6, BY5, BY4, HL4, HL2, and then on 23/10 P29PL and VK6OX.

That will have to do for this month. Some other items, mainly from publications, is on hand but will be carried over until next month. But remember, it is always a possibility that long distance DX may occur suddenly, and without warning during March and April on six metres, so you should be vigilant and look out across the Pacific.

Let us hope the remainder of January treated us well with contacts, perhaps they will not be as frequent as in December, but good nevertheless. Also, it is not uncommon to have good contacts between Melbourne/Adelaide to Albany around the end of January/early February. Next writing will tell you if it happened.

Closing with the thought for the month: *"People's minds are like parachutes. To function properly they must first be open"*. 73. The Voice in the Hills. **AR**

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

DX in the doldrums? No it is still there if one cares to listen and call at frequent intervals on even 10 metres, but it is essential to call and establish a contact, from thereon-in it is like a mini-DXpedition if ones timing is correct.

This column would be interested in running a segment entitled *'My most unusual QSO'*. We have all had some unusual, humourous and, although we may not admit it, rather embarrassing QSOs from time to time, *so why not share your most unusual one with the readers of this column?*

The conditions are simple, entries must be authentic and actual QSOs that have occurred to the writer during his or her amateur career but keep it to about 200 words. *How about it ladies and gentlemen?* Whether it happened half a century ago or last week, do not keep it secret any longer!

Selected entries will be published when space permits.

GRENADA

A vacation DXpedition was to be taken by Bill K4LTA, and other amateurs and their families from the middle of last month until the 5th of this month. At the time of writing they hoped to acquire the call J38A, but as their hopes may not have come to fruition you may have to look for their home calls /J3. You might even hear them signing J34LTA.

The calls of the participating operators, other than Bill are; N4FKC, WA8FSX, N4MMV, NF5Z, K0OSN, N4KOV, W5PWG and N6LHN.

SAO TOME

Luiz S92LB, is still quite active but with poor propagation to VK, particularly in the eastern states, his signals are swamped by QRM.

One VK in the western state of this vast country, didn't believe his luck when he worked Sal S90AS, a visitor to this much wanted country. Sal's home call is IT9AZS, and he was visiting en route to Togo and Benin on business in January. Sal hoped to obtain operating privileges in these countries. For all operations QSL to the home call.

ETHIOPIA AND DJIBOUTI

An operation from ET and J2 is hopefully planned by Jacque W4LZZ, in the near future. Unfortunately, I feel that it would be very risky and may not eventuate due to the present problems in this area.

ANOTHER ISLAND — ANOTHER COUNTRY? ?

According to the media, a small island has emerged near Iwo Jima In the Pacific Ocean.

A Japanese Maritime Self-Defence Force ship, the TAKUYA confirmed that it had appeared and was blasting rocks high into the sky. It appears to be about 700 metres long and 200 to 300 metres wide, having a height of about 15 metres. If there are any volunteers to operate from this area, if and when it cools down, *will it pass the ARRL DXCC criteria for a new country?*

PETER 1 ISLAND AGAIN

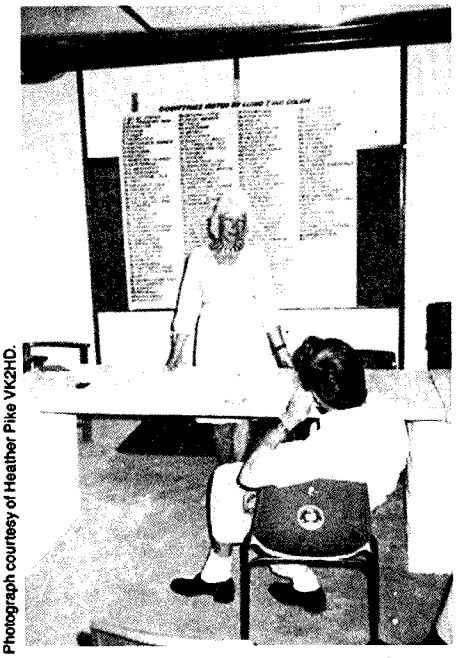
Bob KD7P, states that he is making plans to operate from this one late in the year, whilst en route to the Antarctic. He is seeking landing permission and other necessary documentation. If it comes off he will be travelling south with the Coast Guard.

It is a long way off, but all DXers hope that Bob will be successful in his endeavours.

THE 'GLOBETROTTING' COLVIN'S STORY

Iris, Lloyd and gang made some 5 000 contacts to 137 different countries from Lesotho. Next they were moving on to the Kingdom of Swaziland where they hoped to gain visas and operating permission to visit Mozambique.

They have been very successful in the use of satellites and have had 400 QSOs with 40 different countries.



Photograph courtesy of Heather Pike VK2HD.

Iris W6QL, at the Wind Hoek Radio Club in Namibia, South-West Africa. Iris was giving a talk about the 160 countries that they have visited and operated from.

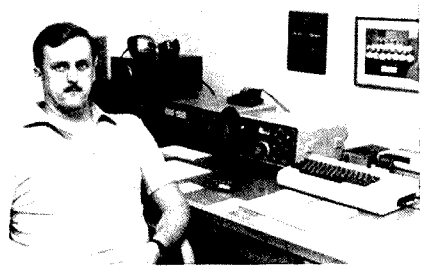
NEWS FROM GUAM

Ed, formerly KB6DAW/KH2, is now sporting the call, AH2BE. Ed has written about his trip to Wake Island during October last year, in which he made 6 200 contacts to 122 countries, all of the US states and 36 Zones in seven days of operating. Not a bad effort Ed, considering your long call sign and the poor propagation into Europe.

Ed's trip coincided with the 50th Anniversary of the first China Clipper flights from USA to the Far East and amateur radio in the area, so there were many celebrations to attend.

Ed flew in on a military aircraft and after being met by the Communications Officer and a representative of the station Commander, was taken to his room where he changed out of uniform and was on-air within an hour. His first contact was HC8E. The equipment varied but was mainly a FT-101B, lent by KC6RM, and a TS-830S which had some receiver problems. In all it was a lot of fun and Ed hopes to do it again this year.

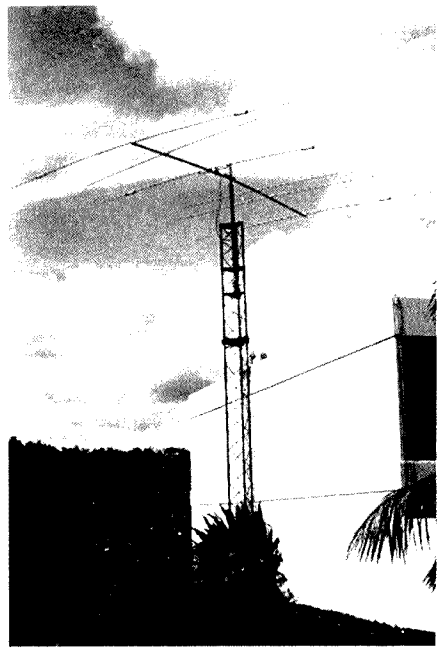
He notes his gratitude to a number of people and organisations for donations and assistance including amateurs P29JS, AH9AC, WH9AAD, NK6T, KC9RM and the military personnel on the base for their help and consideration.



Ed AH2BE, ex KB6DAW/KH2/KH9.

Those who worked Ed and have not requested a card should do so promptly, as he will be tripping off to visit his father-in-law 8P6JQ, and hopes to get an 8P9 call allocated to him during his visit. He will then move on to a long posting in HL land, where he has requested the call HL9MM.

Good luck Ed, an enjoyable holiday and good Dxing in the future. . .(VK3AH).



Ed's antenna on Guam.

AMATEURS HONOURED

Dave W6AQ, a keen DXer, was honoured in last years television Emmy Awards. Dave's production of "Do You Remember Love", a television-movie about a lady suffering from Alzheimer's disease, was nominated and won! Congratulations Dave.

Other amateurs were also mentioned in the same Emmy Awards. The Los Angeles television station, KTTV, took four coveted awards for its daily newscast. The station, thrilled by such a scoop, took a two page advertisement in *Variety*, (an industry daily newspaper) and publicly thanked all the contributors to their success. Amongst those mentioned were Mert N6AWE, Dave N6DKI, Bert WB6MQV, Don WB7ADU, Howard WA6UFM, Bill WA6ITF, Charles WB6SKM and Sudock WB6FDF Amateurs have many talents, some yet untapped and really one never knows who the person is on the other end of the QSO.

DIFFICULTIES!

One OT writing to me on a different subject states that when he built his QTH a quarter of a century ago, he had problems getting the power and water connected, now he is surrounded by 33kV lines, without mentioning the 415 and 240 volt feeders and associated transformers. To add to his QRM generators outside his QTH, a number of two and three storey homes have been built in close proximity. As if the RF attenuation caused by these is not enough, he is confronted with burglar alarms being installed on these premises which are connected with many metres of unshielded wire. These act as excellent antennas and a little

RF from the amateur frequencies actuate them nicely.

This gentleman still operates quite happily on mainly CW and puts his problems down to progress!

The story reminds me of another amateur who recently vacated his QTH with all modern conveniences to move to an area in the 'never never'. The new location will allow him and his family to commute daily to their business and school commitments. To get electricity connected, the cost was to be in the vicinity of $100 000, which he was not too happy about so now he is installing Solar cells to do the job of running the home and of course the transceiver. No power or water, but also no smog or QRM and a long way to go for us to go to have our dog clipped!

TURKEY

A number of amateurs seem to be quite active from this area and it appears that QSLs are being returned quite promptly.

One of the more active TAs is Aziz TA1E, pictured with his FT707 which runs into a dipole.

ON ANOTHER BAND

Photo courtesy of Gil Sones VK3AUI

Well known DXer Steve W6KDK, pictured using two metres whilst out shopping in San Francisco.

INDIA

The newer frequencies that have been allocated are 1.820-1.860, 3.500-3.900 MHz plus the 18 and 24 MHz WARC bands. Activity is high and Gopal VU2GDC, has erected a 160 metre antenna and has an 80 metre beam under construction.

Gopal's neighbours, the OM/XYL team of Vidy VU2DVP and Chitra VU2CVP have been using two element phased Yagi beams on 40 metres with good results.

Rajiv VU2RG, Prime Minister of India, during a recent visit to JA, accepted an offer of an additional loan of thirty billion Yen for co-operation in science and technology. I am sure our hobby will advance dramatically in this country in the next decade.

CONGRATULATIONS

Congratulations are extended to Ditmar VK2APK, for winning the 14MHz Section Trophy in the 1984 CQ CW WW DX Contest. The multi operator station of VI3WI gained 359 388 points with the help of VK2s EFJ, KFQ, 3BPW, VK3CWB and VK3DWN.

It is interesting to note that Mike VK6HD's score of 5 363 on the 160 metre band in 1983 still stands as the highest score for Oceania. Thanks to all who participated in flying the VK 'flag'.

It is also nice to see the calls of VK9NS, VK6HD and VK3QI who have achieved their Five Band Worked All Zones accreditation which is by no means an easy certificate to win. Congratulations on your tenacity in this achievement.

5BDXCC

Armas OH2NB, who recently celebrated his 80th birthday, also received his Five Band DXCC Certificate on the same day, the second time in his lifetime. His first was under the call CT1BCM.

Armas is Honorary President of the Finnish Radio Society. This position is not new to him as, in 1968, he held the similar position with the SRAL.

PROPAGATION

Lee KH6BZF, in his weekly publication KH6BZF REPORTS, gives the predicted smoothed monthly Sunspot values until June this year. The first figure is the Classical Method Value, the second is the SIDC adjusted value; *January = 10/0; February = 9/0; March = 8/0; April = 7/0; May = 6/0 and June = 5/0.*

Not good news really, but there is good DX about. Lee finishes his weekly report by quoting: *'Ever notice — No matter what the results, there is always someone eager to misinterpret it'.* How true Lee.

BITS AND PIECES

Watch for FR7AI/T on Tromelin Island this month, he hopes to activate the area before leaving on the 31st of this month. * * Aruba will not gain new country status until it has gained full Independence. P4/PA0FM is QRV from the area for the next couple of months and frequents around 14.170MHz. * * Jim VR6JR, is QRT and has returned home. * * ZL8OY, very active from Raoul Island in the Kermadec group. * * *The bands dead?* Not in Europe evidently. G4DYO has worked 35 Zones in the period from 1st to 14th January. He only needs Zones 1, 6, 19, 31 and 34 for WAZI * * A number of stations signing . . . /C9, apparently without the paperwork the ARRL DXCC requires. Quite a pity as many VKs need this area. * * Apparently LA5JEA is operating from an oil platform and not an island. Co-ordinates are 58 degrees 11 minutes N and 02 degrees 22 minutes E. * * John OH1JT and Martii OH2BH, operating CT3BZ, were quite busy with QSOs as these notes were being written. QSL to OH2BH. * * A35WZ was operated by NK7K. QSL via NE7W. * * Norbet and Judith, DF6FK/KH8 and DL2ZAD/KH8 respectively, were kept to a steady pace. Both have held VK call signs. * * Watch for VU100CCE and VU100CCI. These special calls are to celebrate a century of Congress. * * Anyone awaiting or wanting a card for 4X37ID should QSL via 4Z4DX. This call was used to celebrate the 37th Independence Day of Israel. This year the call will be 4X38ID. * * The voice behind the microphone of the call J52UAG is YU1AHI. He is installing a commercial broadcast transmitter and operating as time permits. * * Cards for TV6LEO, the station commemorating the Lions Club International Forum in Paris should be sent to F8QB. * * *Did you work CP1JY and never received an answer?* He is now PT2AZ and still has the logs. * * Tom Christian VR6TC, now has the telephone connected. Overseas calls are routed through New Zealand. As the only one on the island with this facility, he should not be too hard to track down. * * As from 1st January, the new prefixes of ZF8 will be used. Cayman Brac will use ZF9. * * VE2EZ states that IRCs are not recognised by the postal authorities in Anguilla. I'll bet *'green stamps'* are though! * * Gerry 5X5GK, is a Russian Orthodox Priest as well as being a medico. His wife is a teacher. * * Albania has an amateur radio system, but not on allocated IARU frequencies. It may not be long before we can expect legitimate operations, but it will take time similar to BY. * * RA4HA helps conduct an Oblast Net around 14.180MHz generally at 1800UTC. * * The station YE3C, was being used to commemorate 40 years of Army communications in Indonesia.

THANKS

Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-QSO, DX FAMILY FOUNDATION NEWSLETTER, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, ORZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, cqDX, ELECTRON, JA-CQ, JARL NEWS, KARL NEWS, OLD MAN, QST, RADCOM, THE SHORT WAVE MAGAZINE, VERON and WORLD RADIO.

Members who have contributed include VKs 2HD, PS, EBX, 3FR, YJ, YL, AUI, 4AIX, 6HD, NE and G3NBC. Overseas amateurs include AH2BE, G1EOD, HI8LC, KB6QAW/KH2, OE2DYL, ON7WW, WB6GFJ and ZL1AMM. Thanks to one and all who make this column possible.

AR

QTHS YOU MAY NEED

CALL	ADDRESS
3D6BU	*PO Box 64, Manzini, Swaziland.*
4V2C	*PO Box 1404, Port Au Prince, Haiti.*
5N25ZHN	*Hassan Zoueihed, PO Box 293, Kano, Nigeria.*
9N1RNK	*PO Box 634, Kathmandu, Nepal.*
A4XZF	*PO Box 981, Muscat, Oman.*
BV7JA	*PO Box 32/13, Kaohsiung, Taiwan.*
BY4AOM	*PO Box 38, Guzhong, Chengdu.*
BY8AOM	*PO Box 227, Shanghai.*
CE0ZIG	*PO Box/Airport, Easter Island via Chile.*
CE9HOP	*Casilla Correo 110, Punta Arenas, Chile.*
CP5LE	*Barbara Grebenstein, PO Box 2268, Cochabamba.*
CV0U	*PO Box 20063, Montevideo, Uruguay.*
CX2CS	*PO Box 20063, Montevideo, Uruguay.*
EA4LH/ XQ0Z	*PO Box 13312, Santiago 21.*
F8EWK	*BP 14, 93190, Livry Gargan, France.*
FT8XC	*3 Rue Victor Boucher, 76440, Forge Les Eaux, France.*
PT2AZ	*Luiz Camargo, SQS 210, Bloca A, AP 201, 70273, Brasilia D/F, Brazil.*
S79CW	*PO Box 4, Mahe, Seychelles.*
SV9PR	*PO Box 1325, GR-71110 Iraklion, Crete, Greece.*
T32AH	*PO Box 667, Aiea, Hawaii 96761, USA.*
TA1A	*PO Box 787, Istanbul, Turkey.*
TA1C	*PO Box 188, Istanbul, Turkey.*
TA1D	*PO Box 1167, Istanbul, Turkey.*
TA1E	*Aziz Sasa, PO Box 794, Istanbul, Turkey.*
TA3B	*PO Box 33, Istanbul, Turkey.*
TI2IY	*PO Box 325, Santa Jose, 2070, Costa Rica.*
TR8APQ	*PO Box 2284, Libreville, Gabon.*
TR8SA	*PO Box 16, Mounana, Gabon.*
TZ6PAM	*PO Box 120, Bamako, Mali.*
VI5IYY	*PO Box 937, Port Lincoln, SA, 5606, Australia.*
YE3C	*Box 187, Surabaya, Indonesia.*
YU3MH/ HK3	*Box 93223, Bogarta.*
ZL8OY	*Kay Hannington, The Terrace, Warrington, Otago, New Zealand.*

Note: Add Peoples Republic of China to all BY addresses.

QSL MANAGERS

3D2EE:W0JEE, 3X0HAB:DL8CM, 4C8J:XE1J, 5B25OA:5B4OA, 5H3BH:SM0EAI, 5H3CE:IK6BOB, 5H3HM:VE5VJ, 5L2CJ:JF2QHC, 5L2EF:KM8E, 6W1KI:F6EWS, 6W1LL:DL1HH, 6W1NQ:DL1HH, 6W1ZF:DL1HH, 6W2EX:F8EYS, 6Y5DZ:WB6UBR, 6Y5FS:GW3YDX, 6Y5HN:KE3A, 6Y5NR/KP1:6Y5NR, 7J1AAO:N7EKX, 7J3AAB:JARL, 7S1SSA:SM1ALK, 8P6CB:N8DCJ, 8P6CZ:VE2YG, 8P6GG:N4CTC, 8P6IB:WA4WTG, 8P6JQ:N8DC, 8P7BE:VE3FXT, 8P9AF:K6ZM, 8P9AG:K6ZM, 8P9AK:AK6T, 8G7AZ:KZ8Y, 8Q7BX:I4LAU, 8Q7CA:PA3DEV.

8Q7CE:DL9GBS, 8Q7CQ:I5JHW, 8Q7CK:I2CRG, 8Q7CQ:I5JHW, 8Q7QW:W9GW, 8Q7RM:JE3MXO, 8Q7YL:JA1AEQ, 8R1L:DJ6BC, AA4VKJ6L:AA4VK, 8P9AF:K6ZM, 8P9AG:K6ZM, 8P9AK:AK6T, 9H3CY:9H1GX, 9X1MX:K4BC, AH6GJ:WA9AEA, BV2DA:DL7FT, BV2FA:DJ9ZB, C9MDB:CT4VS, CR9EU:G3PFS, CQ0NH:CT4NH, CQ5TM:CT1CM, CQ6UW:CT4UW, CV0D:CX1AA, D68DX:PA0GMM, DF4ZL/CT3:DF4ZL, DF8ZH/CT3:DF8ZH, DL1RK/CT3:DL1RK, DL1UF/TI2:WA7KLK, DU1DL:JA0OZZ, DL0AS:DL2HBX, EC9IR:EA9IB, EL0AP/MM:HL5AP, FK0AW:F6BFU, FK8FI:F6FNU, FM4DN:W3HNK, FM4DP:F6FNU, FM4DR:F6FNU, FM4DS:F6FNU, FM4DU:W3HNK, FM5BH:W3HNK, FM5CD:F5VU, FM5CT:N7RO, FM5WD:W3HNK, FM5WE:W4FRU, FM5WQ:W4OPM, FO0LQ:K6ANP, FO0SID:K5BDX, HD4BDC:HC4RA, HP1XKR:JA7AGO, J5CI:G4WFZ, JT0XC:OK1XC, JV1UB:JT1KAA, JW0A:SP2HMT, JW5E:LA5NM, JY9MG:JR3MXG, JY9WR:G4ATS, KC6HA:K6EDV, LF2J:LA7JO, OE5JTL/YK:OE5BA, P29SN/ZL1:ZL2OF, SV9CS:SV Bureau, TI2LCR:TI Bureau only., TV6CEE:F2VS, VK0CC/VI0CC:VK2BCC, VK9NJ:VK2ANO, VK9ZB:VK6YL, VK9ZG:VK6YL, VR6JR:G3OKQ, XQ1ADG:W8KLI, YS1RRD:DJ9ZB, ZM0ZOU:PA0LOU, ZM0ZZZ:K1ZZ.

SOME OF THE DX WORKED BY STEVE VK2PS, USING THE VI PREFIX — Period 17th November 1985 until 31st December 1985.

10 METRES
3D2DW, FK8EJ, JH2KKW, VKs 4ALV, 5AAX, 7VV, 8XF, 9LM, P29s DN, KPD, YC4FRX, ZK1DD, ZLs 1BAG, 2AIS, 3AGG and 4KE.

15 METRES
9N1RNK, BV2DA*, DF4MV*, DL7MAL, F6EXC*, G0BNA, G0CIC, HB9AVW*, OH4RF, OK2BVX*, ON4AAC and YU7ZZ.

20 METRES
Many Europeans plus 9M2SS, DX7SEA, LZ2KAF, YE3C, ZS6VA and ZS6AIS.

** denotes CW operation.*

Steve wonders how many individual amateurs who were using the VI prefix knew the significance of its importance and, if so, did he or she inform their counterpart on the other side of the world of its special significance. One YU that Steve worked proudly announced it was his fifth VI prefix contact. Steve gave a 'commercial' on every QSO of *'This special prefix commemorates the 75th Anniversary of the WIA — VKs National Radio Association'*. Well Steve, everyone knew what it was all about on both the modes you use . . . VK3AH.

INTERESTING CARDS RECEIVED BY VK2PS

Included ones from 9M2FZ, 9Y4GR, BY5RA, HG19HB, KL7NT, LZ40KTS, SV1NAQ, VK75A, YI1BGO and 27 USSR SWL cards.

• STOP PRESS •

RD RESULTS INCORRECT

The Remembrance Day Contest results as listed in February Amateur Radio are incorrect.

Ian VK5QX, the Federal Contest Manager, apologises to all contestants who have been embarrassed by the error.

The correct result listing will be published next month.

QSP

PSYCHIC SPECTRUM INVESTIGATION

The Japanese Government is investigating the possible use of psychic power in telecommunications.

An advisory committee has been set up by the Minister of Posts and Telecommunications to look at whether mental telepathy and ESP could provide new forms of commercial communications.

Japanese officials admitted the project seemed unrealistic, but they added that the US and Soviet Union were already studying the potential of psychic powers.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

1985 ALARA CONTEST RESULTS

Call Sign	Points	Comments/Certificates
VK4BSQ	1047	*Winner Overall and VK4 ALARA Member*
VK3CYL	988	*VK3 ALARA Member*
VK3DYL	688	
VI3KS	603	
VK4VR	585	
VK2EBX	571	*VK2 ALARA Member*
VK3DMH	494	
VK6DE	478	*VK6 ALARA Member*
VK4ASK	461	
VK2SU	404	
VI3XB	401	*OM Certificate*
VK5YL	392	*VK5 ALARA Member*
VK7HD	390	*VK7 ALARA Member*
VK2DIX	311	
VK3NLO	287	*Top Novice Score*
VK4XI	255	
VK3DVT	245	
VK2DDB	242	
VK6YF	232	
VI5GZ	230	
VK2KFQ	227	
VK3DOV	175	
VK4NUN	165	
VI5SJ	150	
VI5ANW	134	
VK2PXS	128	
VE7YL	126	*VE ALARA Member*
VK3XF	125	
VK4BRZ	110	
ZL2QY	110	*ZL ALARA Member*
VK2DHI	105	
VK2JBR	92	*YL Non-Member*
VK2CDB	90	
VK2BRC	89	
VK2AQF	75	
VK2DJJ	70	

Check logs were received from VKs 2KIS and 4ATK.

Please note — the call signs are in order of placings.

Sincere thanks to all who have supported the contest and heartiest congratulations to Wendy VK4BSQ on a very fine effort, to Kim the runner-up and to all the certificate winners.

Thanks also to Marlene VK2KFQ, the Contest Manager.

Some of the comments received were:

Good on the guys, thanks for being around. — A most enjoyable contest. — Didn't hear any overseas YLs on CW.

And from the OMs:

Very casual contest, but operating procedures high. — Where were the YLs on CW? Very few heard. — Perhaps in future contests YLs could identify themselves as such on CW.

It looks as if those of us that have been a bit neglectful of our CW will have to brush the cobwebs off our keys and get in some practice before the 1986 Contest comes along.

Unfortunately, it was not possible to award the Mrs McKenzie Trophy this year.

There were 38 logs received — 22 ALARA members, one YL non-member, 13 OM logs and two check logs.

No SWL logs were received.

VK3 BARBEQUE

The VK3 members held a barbeque at the home of Janet VK3BTU, in Woodend, during November. It was attended by nine members, two children and six supporters. A very enjoyable time was had by all. The weather was windy, showery, and sunny alternately, but the surroundings were very pleasant and relaxing which was conducive to lively and pleasant conversation.

Bonnie VK3PBL, managed to win the inaugural quoits championship, after a close play-off against Joan VK3NLO. It was a mighty battle between two skilled players.

NEW MEMBERS

A warm welcome to Win ZL1BBN, who joined on 26th December 1985, and was sponsored by Joan VK3BJB. Also, welcome- back to Candy VK4NES, who has re-joined.

Martin Aimee FK8FA.

YL ACTIVITY DAY

With some increase in propagation of late, it may pay to check the bands on YL Activity Day — the sixth of every month. Listen on the UTC hour. The most popular time seems to be from about 0400UTC on 14.288MHz.

It is a good opportunity for the YLs to get-together and have a natter.

33

Most OMs and some YLs are unsure of the meaning of "33", when signing-off. 33 was originated by Clara W2RUF, now a silent key, and was adopted by the American Young Ladies Radio League for exclusive YL use. It means 'Friendship between one YL and another YL'. It should be used only in the singular, never plural.

Well, that is all for this month. Until next month, good DX and take care.

33/73 Joy
AR

AUSSAT & TETIA

AUSSAT is Australia's National Satellite System. During 1985, two satellites were launched via the NASA Space Shuttle and are fully operational as of the end of last month.

The Electronic Technician's Institute of Australia (TETIA), Victorian Division, announces that it has arranged for a representative from AUSSAT Pty Ltd to address its March General Meeting to present a technical presentation and update on this new era in space-age technology.

The meeting will be held at the National Mutual Theatrette, 447 Collins Street, Melbourne on Wednesday, 19th March 1986, commencing at 8.00pm.

For further information contact the secretary, Doug Browning on (03) 819 1311.

The TETIA was founded in 1956 to promote and represent the professional aspects of television and electronic technicians and has Divisions in all states.

The first Australian telegraph was opened between Melbourne and Williamstown in 1854. By 1857, Melbourne, Sydney and Adelaide were linked, with the service extending to Western Australia, Queensland and Britain in 1880.

WIA BAND PLAN

The Amateur Service is a secondary service on the 1240-1300MHz band, the primary allocation being for Radio Location. Further, the segment 1260-1270MHz was reserved at WARC 79 for Satellite Communications. Experiments have shown that it is desirable to leave a segment 5MHz wide on either side of the operating frequency of a RADAR installation. Taking into account all of these factors, an FM repeater split of 12MHz has been specified.

BAND SEGMENT	USAGE
1240.0-1241.0	FM Relays and Links
1241.0-1243.0	FM Repeater Inputs
1243.0-1252.0	ATV Channel 1, sound 1251.750; vision 1246.250
1252.0-1253.0	FM Simplex
1253.0-1255.0	FM Repeater Outputs
1255.0-1256.0	FM Relays and Links
1256.0-1257.0	Digital and Packet Radio
1257.0-1260.0	In-Band and Cross-Band Linear Transponder
1260.0-1270.0	Satellite Communication (WARC 79)
1270.0-1280.0	General Use, except in areas where these frequencies are in use for Radio Location (Note 2)
1280.0-1293.0	ATV Channel 2, sound 1292.750; vision 1287.250
1293.0-1295.0	In-Band Linear Transponder
1295.0-1297.0	Weak Signal Modes, including Beacons (Note 3)
1297.0-1300.0	General Use, except in areas where these frequencies are in use for Radio Location (Note 2)

NOTES:

1 All FM operation uses 25kHz channel spacing

2 In Australia, some Department of Aviation RADAR's are centred on 1275.000MHz and 1305.000MHz, while some Department of Defence RADAR's are centred on 1300.000MHz

3 The beacon segment is from 1296.400MHz to 1296.590MHz, with particular frequencies allocated in accordance with the beacon plan.

RADAR LOCATIONS (As listed in AMFAR)

1275MHz — 150 mile range + 1320MHz

VK1 Mount Majura
VK2 Mascot/The Round Mountain
VK3 Tullamarine
VK4 Eagle Farm
VK5 West Beach
VK6 South Kalamunda

1300MHz + 1345MHz

VK2 Williamtown
VK4 Amberley & Townsville
VK6 Pearce
VK8 Darwin

1305MHz

VK2 Mascot
VK3 Tullamarine

1307.5MHz

VK5 Salisbury

FM REPEATER OUTPUT FREQUENCIES AND RECOMMENDED USAGE

OUTPUT: 1253.025-1255.000MHz at 25kHz.
INPUT: 1241.025-1243.000MHz (12MHz split).

FREQUENCY/MHz	USAGE
1253.050	RTTY
1253.100	Mobile Voice
1253.150	RTTY
1253.200	Mobile Voice
1253.250	Data
1253.300	Mobile Voice
1253.350	Data
1253.400	Mobile Voice Secondary
1253.500	Mobile Voice Primary
1253.600	Mobile Voice Secondary
1253.700	Mobile Voice
1253.800	Mobile Voice
1253.850	ATV Liaison
1253.900	Mobile Voice
1253.950	ATV Liaison
1254.000	Mobile Voice
1253.100	Mobile Voice
1254.150	RTTY
1254.200	Mobile Voice
1254.250	RTTY
1254.300	Mobile Voice
1254.350	Data
1254.400	Mobile Voice
1254.450	Data
1254.500	Mobile Voice
1254.600	Mobile Voice
1254.700	Mobile Voice
1254.800	Mobile Voice
1254.900	Mobile Voice
1255.000	Mobile Voice

The above Band Plan was prepared after a detailed examination of the effects of transmission from amateur equipment on the Melbourne RADAR Installations. Accordingly, FTAC is proposing a 12MHz split for 23cm repeater operation.

AR

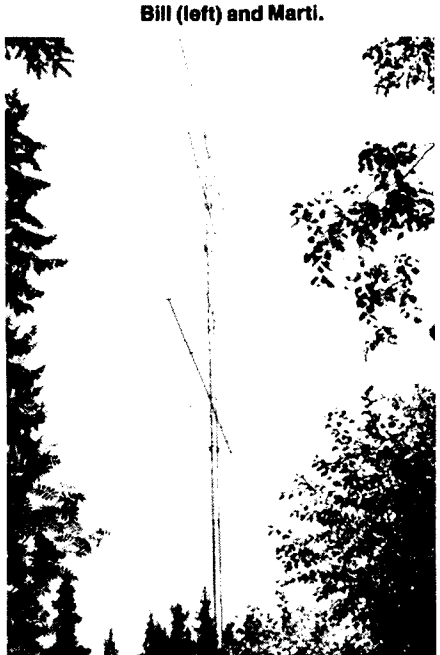
AMATEUR'S OVERSEAS FURLOUGH

Recently, Bill Hempel VK4LC/VK1BH, past-Federal Awards Manager, visited Finland, Japan and England. The highlight of the trip was meeting with Marti Lane OH2BH. Marti is well-known in Australian DX-circles for his trips to many varied and frequently rare DX-locations.

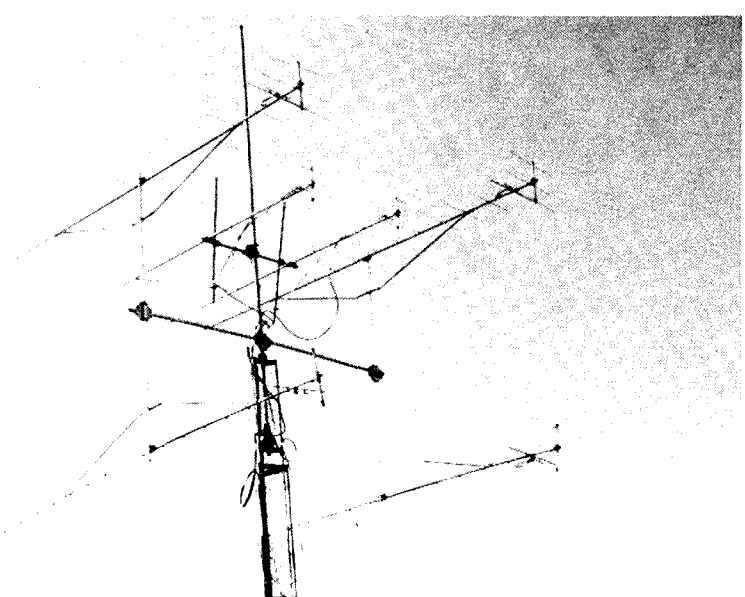
Whilst in England, Bill visited the British Radio Licensing Branch, and although he has held the call sign G4BAW since 1979, was advised to change it to the new reciprocal licence, VK4LC/G0. This call is a mobile call sign and as Bill was travelling most of the time, it was more convenient to use than the required portable/mobile call of G4BAW/A as a separate application is required every time one goes mobile.

Bill visited G4KJF and personally delivered his Worked All VK Certificate. Other amateurs visited were: G2DF; G3WLX; G1JAF; and JH1NVZ.

Bill (left) and Marti.



Marti's tower is 42 metres (140ft) tall, fully rotatable.



Bill's VHF/UHF array. There are two 19 element beams for 432MHz, and four 19 element beams for 144MHz.

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

I think it may have been the custom during wartime for the Americans to name some of their ships after famous people in American history. Be that as it may, the troopship that was taking us through the Coral Sea to an unknown destination was the FREDERICK C AINSWORTH, and I have know idea how they arrived at this name. We got along well with the Americans aboard, their food was first class, although the bunks left a little to be desired.

BARBERS DID A GOOD TRADE

We rounded New Guinea somewhere in the Milne Bay area, continued through the Solomon Sea, and went up by Finschafen. Being well into the Tropics, the Army Barbers did a roaring trade with their six-penny (approx five cents) haircuts.

The ship continued upwards, hugging the coast of New Guinea, and onward through the Bismark Sea. We were heading roughly west, although we still didn't know where we were destined for.

THE "FURPHIES" FLEW

Finally, at about 4pm on a hot Sunday afternoon, we dropped anchor of the coast of the island of Biak. Around us were a vast number of other ships of various sizes, and "furphies" (rumours) spread rapidly that this was where we were to be off-loaded. I looked across the water to the island and could see a signal lamp directed at our ship, about to send a message. Remembering my infantry signal training at the Dubbo camp, where we used Lucas lamps and Heliographs as part of our early training, I told one of my mates to write down the letters as I called them, as I attempted to read the message.

At the conclusion of the message my mate read out the letters I had called. It was instructions to the American Captain on the FREDERICK C AINSWORTH to "up anchor" and be ready to depart in convoy with all the other ships promptly at 5pm.

NO SECRETS

Immediately, we let our fellow soldiers know the contents of the message.

Precisely on the dot of 5pm all the ships began pulling up their anchors and a convoy of 18-20 ships began moving in a westerly direction — a sight I shall never forget.

We continued on a westerly tack for about two days, through the Halmahera Sea, then headed north. Finally, early one morning, after crossing the Equator, we dropped anchor within sight of yet another tropical island. This was our destination — Morotai Island, located two degrees 20 minutes north, 128 degrees 25 minutes east. Our arrival was marked by a significant event in world history.

We had eaten breakfast and were lying on our bunks with full packs ready, awaiting orders over the loudspeaker for us to disembark. Eventually the speakers crackled to life to announce the death of President Roosevelt. That was all. There was then absolute silence throughout the ship as we did not even know that the American President had been ill. When we had recovered our composure we offered our condolences to the Americans.

FROM SHIP TO BOAT

Finally, we received our orders for disembarkation. A number of small flat-bottomed boats — they looked similar to the Putney to Mortlake punt that crossed the Parramatta River in Sydney — had pulled alongside to ferry us to the island. It was very hot, as we were just over two degrees north of the Equator.

It was quite an experience to clamber onto the small boats as we had full packs on our backs, plus rifles, ammunition, helmets, and all the paraphenalia that makes a soldier look war-like. Once on the small boat we all had to stand as there was not enough room to sit down — very uncomfortable in the tropical heat.

It took about half-an-hour from ship to shore, where there were a fleet of army trucks waiting to take us the 19km (12 miles) to our camp — or to be more correct, the camp we had to build as all that was at the camp-site was a couple of dozen tents and a number of four posted roofed structures with no walls which were to be army kitchens.

The camp was set amongst the trees, but it was hopeless to accommodate several hundred soldiers, so one of the first jobs to be done was to cut down some trees to make room for more tents.

TREES COME CRASHING DOWN

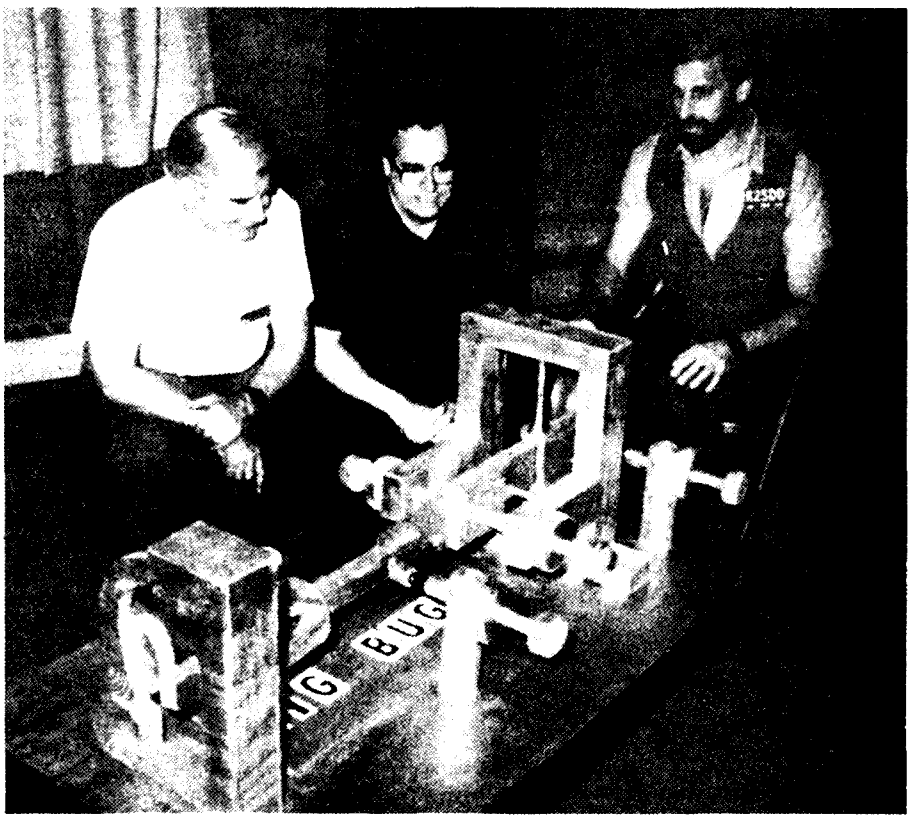
It was customary for a whistle to be blown just before the trees were about to be felled, and I well remember one occasion when the trees almost turned us to pulp. With some mates I had been doing some "spine-bashing" (resting) in what we thought was well out of the danger zone. However, a whistle blew and I got up from my bunk, opened the tent flap and looked out. As I did so I saw a huge tree about to hit the tent. With a yelp, I screamed to my mates, who all vanished like tropical lightening. The tree trunk cut the tent in half and took much of our gear with it.

There was an amusing side to the story though, ours was the only tent that boasted a rifle barrel that could shoot around corners.

73 till next time, Joe.

AR

THE BIG BUG



Readers of the Pounding Brass columns of recent times will be familiar with the competition Marshall has been conducting — re large keys. Whilst browsing through *Worldradio*, November 1985, the accompanying photograph and article by Vivian Douglas WA2PUU, seemed appealing.

With amateurs always searching for better antennas, better signals, bigger scores, faster speeds, miniature rigs — anything to keep the mind improving and challenged, two amateurs found this challenge to be fun.

The idea was formulated by Jim Mozley W2BCH and brought to reality by Jeryl Wright NK2C, developed into a BIG BUG.

The idea began at a radio club meeting of the Radio Amateurs of Greater Syracuse (RAGS) when they wanted something different for an Old Timers Night. Jim suggested and sketched plans for a Vibroplex Bug, a perfect replica of the one he operates with.

Scaled at nine inches to one inch, Jeryl made the Bug completely out of wood with a steel spring. Copper contacts were made from wood with copper pipe cap inserts. Lathe-turned round parts and a sliding wooden weight makes the key fully adjustable over a wide range.

The finished product measures 33 by 53 inches and each detail is exact.

Condensed from Worldradio, November 1985.

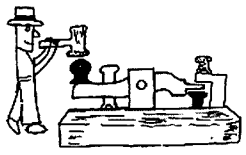
FROM LEFT: Jim W2BCH, Jeryl NK2C and Mike K2SD, RAGS President.

ANTARCTIC QTHS AVAILABLE

More than 100 well-paid jobs are available in Victor Kilo Zero-Land ranging from administration positions to zoologists.

The Antarctic Division said the lowest paid expeditioner gets over $35 000 remuneration whilst away from Australia.

Most trades are wanted including cooks, carpenters, and communications officers.



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

GETTING YOUR SPEED UP

The column this month repeats a topic used about two years ago. If it sounds familiar, bear with me. In my early days, 20 WPM was my goal, but now we are ready to scale new heights. We will start with getting from five words-per-minute to 10, or more, and conclude with the rarefied atmosphere of the 40 WPM operators. *How did they get there?*

The best way to learn is to do; the best way to increase you CW copying ability is to copy, off air. The WIA sponsors slow CW broadcasts every night of the week. These are designed specifically to help people get to the speed necessary for the NAOCP and AOCP Morse examinations, and are highly recommended. W1AW, the official station of the ARRL, broadcast practice material and news, in CW, from the USA on several bands. Schedules are published in QST.

Let us assume you know the code, perhaps you have even passed the Novice receiving exam, and now want to get your speed up to Full Call level — or better yet, you want to get your speed up so you can use CW effectively.

Of the two, the latter motive is a better one, because if you are trying to improve your copying ability, you are, at the same time, preparing yourself for the exam; but if your only goal is to pass an examination, you have set yourself too low a target.

There is something like a 'sound barrier' in learning Morse code. For years it was thought that a plane could not possibly break the sound barrier, and similarly, many operators get to a speed of around eight to 10 WPM, and are convinced they cannot go any further. This is because there are three ways a person can copy code, and there is a real barrier to get through. The first means of copying, which all of you remember from your first attempts at learning the code, is called 'character look-up'. In the learning stages, the right side of the brain is listening to the signal while the left side of the brain is comparing the received signal with a list of coded meanings — once the meaning has been recognised, an order goes back to the right side of the brain so the hand can write the perceived character. There is a limit to how fast you can do this, but it varies from person to person, in the range of about eight to about 15 WPM.

Once you reach this barrier you cannot improve your speed without going on to the second way of copying, which is character recognition. With character recognition, there is no process of translating between the two hemispheres of the brain. The sound of each character is recognised for what it is, and the hand writes the character without any conscious thought process involved. The same thing happens when you are learning a foreign language. When you are first learning the language you translate everything as you go, but as you improve your ability you find you can 'think' in the foreign language without having to translate it. And, as with the code, some people never make the transition from translating to thinking.

Extending the analogy with foreign languages a step further, it has been known for years that if a person begins to learn early enough, by extensive exposure, the chances of becoming fluent are much greater. This applies equally to learning the code, and if you learn by identifying sounds, rather than counting dits and dahs, the transition to higher speeds is much easier.

It is worth noting, that some people cannot get over the hump, no matter how hard they try. Quite often these people suffer (unknowingly) from a mild form of 'dyslexia'. Dyslexia is a reading disfunction characterised by mental transposition of characters, and as you can imagine it can present severe problems in learning code. It can exist in varying degrees, and a person who has never suspected he is dyslexic can suddenly find an insurmountable obstacle when trying to copy code at 10 WPM.

Anybody can learn the code, and anybody can pass the five words-per-minute exam if they are given enough practice. But some people simply cannot pass the 10 WPM exam because it is beyond the barrier. These people would be very rare, I'm sure, but asking them to pass the exam is a bit like asking a blind man to sort resistors by means of the colour code — a bit unfair.

The key to improving your speed is to practice with characters sent at a much higher speed than the speed at which you can copy 100 percent. If you can afford the BT2 Morse Trainer, which starts you off with a character speed of 18 WPM, with three second pauses between characters, you are 'home and hosed'. Follow the instructions and you will be a 20 WPM man in no time.

If the technology isn't available, you will have to make do with what is available on the bands. The WIA broadcasts are excellent, but their primary objective is to get people through exams, so they mostly don't go beyond about 12 WPM, or so. Here are four handy hints for getting your speed up in a hurry. . .

Listen to the real brass-pounders on 20 metres. They may be going way too fast for you, but if you concentrate on identifying the odd character, you will soon find that you are starting to get more of it.

Practice with the Japanese stations on 15 metres. Call CQ a bit faster than you can copy, and ask for repeats when necessary. The Japanese, as a group, are the most polite and helpful operators on the air.

Enter a CW contest. You will have to listen to calls and numbers several times at the beginning, but a few hours later you will be picking them up first time.

And the last hint! ! ! - *throw the microphone away. Well, not literally, but why not unplug it for a while?*

When I was trying to get up to speed I made a solemn vow that I would not engage in a phone QSO until after I had made a CW contact. Even now I can sometimes go for a whole week without touching the microphone. To get your speed up you need practice, and to keep at it you will need self-discipline. Keep at it, and you will get there — if you follow all these hints religiously you will be a top operator in next to no time.

Then one day you will be sitting there copying at 20 WPM, or so, and suddenly realise — my speed has stopped going up. Uh-oh. You have just crashed into the second 'sound barrier'. Fortunately, this one isn't serious, and you will eventually begin to slide through it without having to work at it.

The third and final way of copying code is phrase recognition. Rather than listening to individual characters, you start to hear whole words and phrases. In the earlier stages, long before you get to 20 WPM, you will have noticed that some expressions, like 'DE' and 'RST' are immediately recognisable without having to identify the individual characters. The more you operate, the more you build on this list of identifiable words (as opposed to characters), and eventually you will recognise all of the words that are commonly used in amateur traffic. Where a new one occurs, you will continue to copy while your mind 'plays back' the unfamiliar code and tries to make sense of it.

This is how you get to be a real code operator. You have probably wondered how anyone can copy at 40 WPM or more — now you know. Once you start recognising phrases there are no real barriers left, except the ability of the human ear to discriminate, or of the machine to generate. The record for CW copy is around 75-80 WPM.

Somewhere on the way to the upper regions you will have to leave your manual key behind, and become competent with an electronic keyer (or perhaps a mechanical auto-key).

You will also have to discard your pencil. There is a limit to how fast you can write, especially while you try to understand the content of what is being sent, as well as the actual words. Here again, practice is the answer. At first you will be concentrating so hard on the code you will have to go back and read your own copy to understand what was sent. After a while, you will find yourself knowing nine times out of 10 what the word is before it is completely sent. This is the process called 'journalising', so much frowned upon when you are studying for an exam, or copying coded traffic. But it is the way to go if you hope to be a competent CW operator, because it is right 90 percent of the time, and gives you a chance to relax your mind while you are copying.

In the end, you will get to a point where you can listen without transcribing — just make the occasional note. Professional operators are always shown using typewriters, and there is a reason for this — the hand will get tired and give-up before the brain does, at around 25 WPM. A good typist can type, without thinking about it, at speeds up to 100 WPM, or more. This is the only way to go if you need hard-copy.

Finally, speed should never be an end in itself. Once you get to 40 WPM, or more, who will you work? Mostly people who are slower, *right?* Right. There will come a day when you realise you are comfortable with the speed you are working — you can strain a bit and get the faster traffic, or relax and enjoy chewing the rag at 20-25 WPM. Then you can stop worrying about speed and make CW 90 percent fun and 10 percent work, instead of the other way around.

73 till next month.

AR

Magazine Review

Roy Hartkopf, VK3AOH
34 Toolangi Road, Alphington, Vic 3078

(G) General : (C) Constructional : (P) Practical without detailed constructional information : (T) Theoretical : (N) Of particular interest to the Novice : (X) Computer Program

C Q OCTOBER 1985 — 1984 World-Wide CW DX Results. CQ WW DX Contest All-Time Phone Records. 160 metre DX Contest Rules. Contest Calendar for October and November. Quick Conversion of L4B for use with the 3CX120047. Unvarified Highest Scores of 1985 CQ WW WPX CW Contest. Understanding Modern Amateur Gear, Part 3. Review of Kansas City Keyer KC-1. New Innovation — Registration of Missing People.
C Q NOVEMBER 1985 — RTTY Special Including Packet Radio. (G)
WORLDRADIO DECEMBER 1985 — Humanitarian Activities in Amateur Radio including Mexican Earthquake. News and Views over the World. Amateur Personality Test. QRP (G). Report on first SSTV in Space. Report of Amateur Participation in Balloons over the Atlantic. Roof Mounting of a Trap Vertical.
RADIO COMMUNICATION JANUARY 1986 — Direct Conversion CW Transceivers. (P) Rotator Speed Controller. (P) Index for 1985.
HAM RADIO NOVEMBER 1985 — Tapered Elements. (G) 75 (80) metre Transceiver. (C) Home Brew Receiver. (N).
C Q TV MAGAZINE No 132 — General Information, News, Circuits, Amplifiers, etc for ATV. 10GHz Video Beacon.

AR

STOLEN EQUIPMENT

The following amateur radio equipment has been reported, by the Melbourne office of Emtronics, as being stolen.
1 x 1C735 Ser No 36304455
1 x 1C290H Ser No 17703342
If you are offered one of these items or know of their location please contact Sen Det Ewann McDonald on (03) 329 0000.

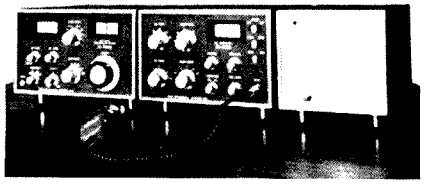
KNOW YOUR SECOND HAND EQUIPMENT

A Series to Help You Identify Amateur Equipment

Ron Fisher VK3OM,
3 Fairview Avenue, Glen Waverley, Vic. 3150

This month we will look at the early Icom equipment. In actual fact, the Icom name did not come into use until a few years after the company was founded. The original equipment was called Inoue, after the founder of the company.

The first Inoue equipment to arrive in Australia was imported by Syd Clark VK3ASC, and this was the IC-700, an HF transceiver. At this time, Inoue was also building two metre FM equipment. The FDFM-2 was one such model but, although sold in the USA, none were imported into this country.



INOUE IC-700 TRANSCEIVER

Introduced to Australia in mid-1969, the IC-700 was a transceiver in three parts. The basis of it was an amateur band receiver covering 3.500 to 29.500MHz in 500kHz segments. VFO calibration was in 1kHz steps and a CW filter was standard equipment. The transmitter section was in a similar sized cabinet, using a pair of 6146s. Apart from the final stages of the transmitter section, everything was solid-state. Frequency control of the transmitter came from the receiver.

An AC power supply/speaker unit completed the set up. As I have never had the opportunity to use one of these, I cannot comment on the performance, however, from the specifications, it would seem to have been quite reasonable for the time.

The price for the combined unit was $505. Second-hand value would be around $225, today.

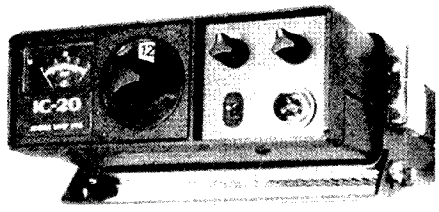
INOUE IC-20 2 METRE FM TRANSCEIVER

This unit was first introduced into Australia by the Industrial and Medical Electronic Company of Melbourne, in mid- 1971. It was a 12 channel solid-state FM transceiver, with crystal controlled transmit and receive frequencies.

Construction was somewhat different, with several individually shielded modules held into the main chassis frame. Overall size was quite compact and slightly smaller than the Yaesu FT-2FB. Transmitter power output was rated about 10 watts output, with most producing 12-14 watts. Receiver performance was good, the sensitivity specification was 0.35μV for 20dB quieting.

Price new was $295, with two channels fitted, second-hand value today would be around $85.

Later in its production run the Inoue IC-20 became the Icom IC-20.



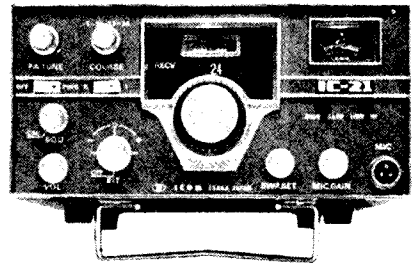
ICOM IC-21

This two metre FM transceiver was released in early 1974. The IC-21 was a home station version of the IC-20. In addition to the usual IC-20 features, the 21 boasted a built-in AC power supply, receiver offset tuning, a discriminator meter calibrated in frequency ± from nominal, and a self-contained SWR meter. Constructed in a very smart table-top cabinet, the IC-21 was an excellent addition to the shack.

New price of the IC-21 was about $275 with the usual tree channels installed. Value today of a second-hand model would be about $125.

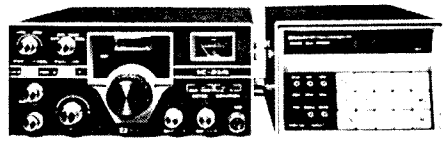
ICOM IC-21A

The Icom IC-21A was released in late 1974. In



actual fact the IC-21 (see above) is a rare piece of equipment. It was soon superseded by the 21A. Identical in appearance to the 21, the 21A was up-graded in several aspects.

Perhaps the most significant difference was the ability to use the matching digital DV-21 external VFO. The DV-21 was a key pad frequency selection synthesised VFO with digital frequency display. Unfortunately, frequency coverage was limited to 2MHz, 146- 148MHz. In its day this was quite a device!



Frequency scanning and memory channels were yet another of its features. However, with all the good features, there was also one problem — reliability. I doubt that there would be many DV-21 VFOs in working order today.

New price of the IC-21A was $285 and the DV-21 — $298. Second-hand value today would be about $135 for the IC-21A. The DV-21 price would depend on whether it still works — perhaps $50.

AR

RADIO PRIMER

There are two sorts of electrons, or is it three? The third group are real live wires so they may be eliminated in this primer.

The main two electrons which this primer is interested in are: Radio Frequency and Audio Frequency electrons, known simply as RF and AF

Any school student knows electrons tend to travel at various rates of frequency. AF electrons travel slowly enough to be heard — even by older people with feeble hearing. It is true to say that radio and television manufacturers would not be in business today if it were not for this basic fact. RF electrons at the lower end of the frequency scale are no more than glorified D class electrons who put one over older people, but not so toddlers. Those electrons at the highest end of the scale could be classed as the elite RF electrons and are A1. They are small in character, but intense in number. Their most noticeable problem is one of always getting sunburnt.

The middle range RF electrons do the most work and are the most common, being widely used everywhere. They are also the easiest to catch. They gather like starlings on a wire at sundown. There is little sport to be had in catching them. Apart from these most interesting facts, all electrons in the RF groups are decidedly superior to the slower AF ones.

This is why current lags voltage and vice-versa!

There are zillions of these RF electrons hanging about; just turn on your radio to listen to your favourite program and herds of these smart RF electrons are there — just waiting. Just how do you sort out the ones you want from the zillions that are milling about?

If you have ever dabbled in farming then the answer is simple. A device like a cattle chute and grid. This device, termed a 'mixer', grabs plenty of them, beats them all up, makes them giddy, pushes the selected ones through the grid and shoves the rest down the chutes. Nothing to it really and all so simple. All very basic, so far.

This sample batch has been given a very special task. It must try and get past the crowd at the stage called a 'detector'. The detector is a very selective process, most likened to a barrier. Some get through, others are tossed back with the choice of lowering themselves or going to ground. There is indeed a struggle at these gates with RF and RF electrons in every phase of the action. It is a highly discriminative situation and is a wonder no one has ever passed a law against it.

The RF electrons complain that they have carried the AF electrons for far too long and are reluctant to be pushed into the ground. No matter how long the freeloaders protest, they are conned every time. Occasionally they do win out for a time but, being thought of as superior electrons, they can't help giving the game away. They are promptly dealt with once contempt has been shown with a display of raspberries, or similar. Except in this instance, most decisions are heavily biased in the favour of the lowly AF electrons. The speaker gets to have the final say and blabs to anyone who is prepared to listen.

Contributed by E C Brockbank VK2EZB
AR

QSP

NEW VIDEO TAKES OFF!

A new 8mm video with a tape about the size of an audio cassette could replace the current standard 12.65mm (half- inch).

Approximately 120 manufacturers, including all the Japanese, were turning production to 8mm and industry sources say it is only a matter of time before it becomes the world standard.

NO SHOCKS IN THIS NETWORK

A Sydney company, Quanta Electronics, has introduced a device which turns mains power outlets into a microcomputer network.

Quanta say their Nectar Ring, a high technology box, links stand-alone machinery into a network without the need to install new cables in an office or factory.

The company say the system is completely safe for users, data and computers.

MORE IN OCEANIA

The population of Oceania, a grouping which includes Australia, New Zealand and other smaller Pacific islands, grew by 4.2 percent to 25 million in the June 1985 year.

This compared with a world-wide population growth of 1.7 percent, according to the United Nations.

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

AMSAT Australia

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685MHz — Summer: 7.064MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGEMENTS

This month I am very appreciative to the UOSAT Team for the information contained in Bulletin 161 — 17th January 1986. Also, contributions were received from Bob VK3ZBB and Graham VK5AGR.

AMSAT-AUSTRALIA NEWSLETTER

Graham VK5AGR, the National Co-ordinator of AMSAT-Australia, is now producing a monthly newsletter containing updated satellite news, orbital predictions, Keplerian data and operating hints and techniques. The objective of the newsletter is to keep the amateur populous informed on the latest information available, and to realise funds for the funding of projects, or the purchase of an item/s of hardware for a future amateur satellite project; eg Phase-3C, 4, or whatever. The cost of the Newsletter is $15 and cheques made payable to the WIA South Australian Division should be forwarded to Graham, QTHR.

To the present time the Newsletter has been a resounding success within Australia and comments are now being received from overseas amateurs, who have received copies from friends in Australia which indicate they too would like something similar in their own countries.

The Newsletter is basically an eight-page compendium of the nitty gritties that are relevant in the short-term, items that are basically out-of-date when printed in this column. To date, it has included some small computer programs specifically for satellite determination, the latest telemetry blocks from OSCAR 10 and OSCARs 9 and 11. If you are at all interested in satellite communication, this newsletter is a must.

UOSAT-2/OSCAR 11 DCE EXPERIMENT

Included in last months column was information relating to the Digital Communication Experiment (DCE) Version-2 Software, which is currently in use of board OSCAR-11. As mentioned in that article, there is a Cyclic Redundancy Check (CRC) appended to each frame. Included this month, courtesy of the UOSAT Team, are the respective Assembly Routines for the 6502 and Z80 Microprocessor Chips for those interested in writing their own software. I can personally recommend the Z80 routine, as I have included it in my software to read the DCE Title Frames. The routines are as follows:

CRC CALCULATION FOR DCE FRAMES

Every DCE frame ends with a two Byte CRC. The CRC is an error detection code, and if you use the CRC equation on a received frame, your two-Byte answer should match the two-Bytes transmitted at the end of the frame. The CRC used on the DCE is calculated using a modified CCITT CRC algorithm. For those familiar with CRCs, this CRC uses a 16-bit shift register to implement the equation (**x^16 + x^12 + x^5 + 1**). if you wish to study how the DCE implementation differs from this, or if you simply wish to implement CRC checking for DCE frames, see the following Z80 and 6502 machine- language programs. In using these programs on DCE frames, remember that

OSCAR-10 APOGEES
MARCH 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st March										
60	2044	0553:11	-26	244	274	53	286	65	357	83
2nd March										
61	2046	0512:11	-26	235	281	62	302	73	57	79
3rd March										
62	2048	0431:11	-26	226	293	71	335	79	76	70
4th March										
63	2050	0350:11	-26	216	317	78	30	79	84	61
5th March										
64	2052	0309:11	-26	207	13	81	61	72	90	52
6th March										
65	2054	0228:11	-26	197	56	75	75	64	95	43
7th March										
66	2056	0147:11	-26	188	73	67	83	55	99	34
8th March										
67	2058	0106:11	-26	179	82	58	89	46	103	25
9th March										
68	2060	0025:11	-26	169	89	49	94	38	106	17
68	2062	2344:11	-26	160	94	41	99	29	110	9
10th March										
69	2063	1123:41	-26	335					247	4
69	2064	2303:11	-26	150	98	32	103	21	115	2
11th March										
70	2065	1042:41	-26	326					251	12
70	2066	2222:11	-26	141	102	24	108	13		
12th March										
71	2067	1001:41	-26	316			245	2	255	20
71	2068	2141:11	-26	132	107	16	112	6		
13th March										
72	2069	0920:41	-26	307	244	-0	250	10	259	28
72	2070	2100:11	-26	122	111	8	117	-1		
14th March										
73	2071	0839:41	-26	297	248	7	254	17	263	37
73	2072	2019:12	-26	113	115	1				
15th March										
74	2073	0758:42	-26	288	253	14	259	25	267	45
16th March										
75	2075	0717:42	-26	279	257	22	263	33	272	55
17th March										
76	2077	0636:42	-26	269	261	30	268	42	278	64
18th March										
77	2079	0555:42	-26	260	266	39	274	51	288	73
19th March										
78	2081	0516:08	-26	250	270	48	281	59	314	81
20th March										
79	2083	0435:08	-26	241	276	56	291	68	27	83
21st March										
80	2085	0354:08	-26	232	285	65	311	76	66	75
22nd March										
81	2087	0313:08	-26	222	300	74	355	80	79	67
23rd March										
82	2089	0232:08	-26	213	334	80	44	77	86	57
24th March										
83	2091	0151:08	-26	203	33	79	66	69	92	48
25th March										
84	2093	0110:08	-26	194	63	72	78	61	96	39
26th March										
85	2095	0029:08	-26	185	76	64	85	52	100	31
85	2097	2348:08	-26	175	84	55	91	43	104	22
27th March										
86	2099	2307:08	-26	166	90	46	96	35	108	14
28th March										
87	2100	1046:38	-26	341					244	-1
87	2101	2226:08	-26	156	95	37	100	26	112	7
29th March										
88	2102	1005:39	-26	332					248	7
88	2103	2145:09	-26	147	99	29	105	18	116	-1
30th March										
89	2104	0924:39	-26	322			242	-2	253	15
89	2105	2104:09	-26	138	104	21	109	11		
31st March										
90	2106	0843:38	-26	313			247	5	256	23

OSCAR-10 APOGEES
APRIL 1986

DAY	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
0th April										
0th	2107	2023:08	-26	128	108	13	114	3		
1st April										
1st	2108	0802:38	-26	303	246	2	252	12	260	31
1st	2109	1942:08	-26	119	112	5				
2nd April										
2nd	2110	0721:38	-26	294	250	9	256	20	264	40
2nd	2111	1901:08	-26	109	117	-2				
3rd April										
3rd	2112	0640:38	-26	285	254	17	261	28	269	49
4th April										
4th	2114	0601:05	-26	275	259	25	265	36	274	58
5th April										
5th	2116	0520:05	-26	266	263	33	270	45	282	67
6th April										
6th	2118	0439:05	-26	256	268	42	276	54	296	76
7th April										
7th	2120	0358:05	-26	247	273	51	284	62	336	82
8th April										
8th	2122	0317:05	-26	238	280	59	297	71	45	80
9th April										
9th	2124	0236:05	-26	228	290	68	324	78	71	72
10th April										
100	2126	0155:05	-26	219	310	76	15	79	81	63
11th April										
101	2128	0114:05	-26	209	356	81	53	74	88	54
12th April										
102	2130	0033:05	-26	200	46	77	70	66	93	45
102	2132	2352:05	-26	191	68	69	80	57	97	36
13th April										
103	2134	2311:05	-26	181	79	61	87	49	101	28

SATELLITE ACTIVITY FOR PERIOD 1 to 30 NOVEMBER 1985.

1. LAUNCHES.

The following launching announcements have been received:-

1985-105A	Cosmos 1701	Nov 9	USSR
106A	Cosmos 1702	Nov 13	USSR
107A	Raduga 17	Nov 15	USSR
108A	Cosmos 1703	Nov 22	USSR
109A	STS-61B	Nov 27	USA
109B	Morelos-B	Nov 27	Mexico
199C	Aussat-2	Nov 27	Australia
109D	Satcom KU-2	Nov 28	USA
109E	Oex Target	Nov 30	USA
110A	Cosmos 1704	Nov 28	USSR

Notes:-

1. On board STS-61B, utilising Shuttle vehicle Atlantis were B.H.Shaw, J.L.Ross, S.C.Spring, R.N.Vela, B.D.O'Connor, Mary L.Cleve, and C.D.Walker.
   The payload included an Imax Payload Bay Camera, a Continuous Flow Electrophoresis System and satellites Morelos-B, Aussat-2, Satcom KU-2 and Oex Target. The orbit elements were apogee 370km, perigee 361km, inclination 28.5 deg and period 91.9 min.
2. Morelos-B elements were apogee 36900km, perigee 350km, incl'n 25.8° and period 655.8 min.
3. Aussat-2 elements were apogee 36571km, perigee 35765km, incl'n 0.3°, and period 1455.6 min.
4. Satcom KU-2 elements were apogee 35254km, perigee 329km, incl'n 26.4 and period 623.2 min.
5. Oex Target elements were apogee 386km, perigee 372km, incl'n 28.5° and period 92.1 min.

2. RETURNS.

During the period thirtyfive objects decayed including the following satellites:-

1985-081A Soyuz T-14 Nov 21, 1985-096A PRC 17 Nov 7,
1985-104A STS-61A Nov 6, 1985-106A Cosmos 1702 Nov 27.

the CRC covers all Bytes from the <cmd> to the end of the <data> segment. It does not include the CRC itself, or the leading <10h><03h> Bytes.

6502 CRC CALCULATION

The following sub-routine uses three zero page locations:

&80 (hex 80) is a scratch location

&81 is the most significant Byte of the CRC (transmitted first)

&82 is the least significant Byte of the CRC (transmitted second)

When a new frame is to be checked, &81 and &82 must be set to zero. Then the routine must be called once for each Byte in the received frame, with that Byte in the A register. After this, &81 and &82 will contain the CRC Bytes. These Bytes can then be compared to the received CRC Bytes.

```
 50 .CKSUM
 60 STA &80
 70 LDX #8
 80 .CRC2 LDA &80
 90 ROL A
100 BCS L1
110 AND #&FE
120 JMP L2
130 .L1 ORA #1
140 .L2 STA &80
150 LDA &81
160 ROL A
170 STA &81
180 LDA &82
190 ROL A
200 STA &82
210 BCC CRC4
220 LDA &82
230 EOR #&10
240 STA &82
250 LDA &81
260 EOR #&21
270 STA &81
280 .CRC4 DEX
290 BNE CRC2
300 RTS
```

(Strings preceded by "." are labels. Numbers preceded by "&" are hexidecimal, and numbers preceded by "#" are immediate data).

Z80 CRC SUBROUTINE

This subroutine uses the HL register pair in the same way that the 6502 subroutine uses the zero-page locations &81 and &82

When starting to CRC a frame, set HL to zero. Call the routine with each Byte of the frame in the A register. Then, the frame's CRC will be in the HL register pair. The Byte that is transmitted first is in L and the Byte transmitted second is in H.

```
;
;  COMPUTE CRC ON A, INTO HL
;
CKSUM:
    PUSH AF
    PUSH BC
    LD B,8
    LD C,A
CRC2:
    LD A,C
    RLCA
    LD C,A
    LD A,L
    RLA
    LD L,A
    LD A,H
    RLA
    LD H,A
    JR NC, CRC4
    LD A,H
    XOR 10H ;CCITT; OR USE 80H
    LD H,A
    LD A,L
    XOR 21H ;CCITT; OR USE 05H
    LO L,A
CRC4:
    DEC B
    JR NZ,CRC2
    POP BC
    POP AF
    RET
```

CRC SUMMARY

To check a DCE frame for errors, call the CRC subroutine for each Byte in the frame, starting with the <cmd> Byte and ending with the last Byte in the <data> field. Compare the results of this calculation with the received CRC, the two Bytes that follow the <data> field. If the CRC that you have calculated matches the CRC that you receive, then there were no errors in the received frame.

SIDERIAL CONVERSION FACTORS — 1986-1999

For those readers who are running satellite prediction programs, the siderial conversion factors for 1986 to 1999 are as follows:

YEAR	GMST	YEAR	GMST
86	0.27601916	93	0.27685328
87	0.27535606	94	0.27619018
88	0.27469296	95	0.27552708
89	0.27676777	96	0.27486399
90	0.27610467	97	0.27693880
91	0.27544157	98	0.27627570
92	0.27477847	99	0.27561260

The above information is courtesy of Graham VK5AGR, and the AMSAT-Australia Newsletter.

UOSAT NEWS BULLETIN

With acknowledgement to the UOSAT-OSCAR-9 Bulletin-161, 17th January 1986, we have the following items.

MARCE

Following the several delays in the launch of STS-61C, the MARCE payload appears to be operating well with reports from a number of ground-stations of telemetry received both direct and heard through AO-10. Marshall Space Centre experimenters have requested copies of telemetry to be forwarded to them — please.

SOVIET SPACECRAFT (G3IOR)

RS-9 and RS-10 are now complete, tested and ready for launch, probably early this year. RS-10 incorporates a 15m up to 2m down transponder with two band-limit beacons on 145.957 and 145.997MHz. Licence authorisation is still awaited for the 435.395MHz beacon. The two spacecraft may be launched separately. They may possibly have been launched last month.

A further delay in ISKRA-4 is now probable following the premature return of one of the SALYUT-7 Cosmonauts, due to illness in early December 1985. The next, replacement, launch for SOYUZ was expected on 16th January or 3, 4, 16th February, with the possibility that one of the Cosmonauts may have been a radio amateur. Discussions have taken place for Soviet amateur radio operation from the SALYUT-7 space station.

ARSENE

A report from G3IOR, indicates that the French AMSAT ARSENE satellite is progressing towards a future ARIAN launch. The mechanical structure is complete and spin balance and vibration tests have taken place. The prototype spacecraft electronics are performing to specification with work progressing on the antenna and solar array deployment mechanisms, command and telemetry systems and the new Apogee kick motor.

DX

A special call sign, ZS6JCF, has been issued to celebrate the 100th Anniversary of the city of Johannesburg. The call sign, ZS6JCF (Johannesburg Centenary Festival), will be used throughout 1986. Watch for ZS6JCF on AMSAT OSCAR-10 Mode B. They began operating on 11th January between 1200 and 1500UTC. Mode L activity will be announced later. A special gold-leaf QSL card will be issued for all satellite contacts.

UOSAT SPACECRAFT OPERATIONS

DCE REPORT (G0/K6K)

Development of ground-station software for DCE operations has continued, both at Surrey and in Los Angeles (USA). The following commands are available to DCE ground-stations, and the list provides insight into the operation of the DCE mailbox.

LOGIN tells the DCE the call sign of the ground-station.

LOGOUT frees the DCE for use by another ground-station. Logout is automatic if the DCE does not hear the ground-station for two minutes.

PUT is used by the ground-station to store a message to the DCE.

CONTINUE allows the ground-station to continue (on another orbit) a PUT operation that was interrupted by LOS.

GET is used to retrieve a message from the DCE.

KILL deletes a message.

END resets DCE software to the title-display mode, without logging out the ground-station. Thus, the DCE has all of the commands needed in a computer bulletin board system. A command will soon be added to allow a station to GET all new messages directed to that ground-station. Efforts are under way to bring up more DCE ground-stations. Before the end of January, it was expected that stations in at least two more countries would be operating.

DCE OPERATIONS (G0/K8K at UoS)

This week's (17 January) DCE operations concentrated on further hardware tests at NK6K in Los Angeles and the forwarding of a few messages from G0/K8KA, via the UO-11 DCE to US packet stations. Operations at UoS have been going sufficiently smoothly that DCE operations have not monopolised the S/C downlink, and listeners in the UK and Europe have experienced a reasonable amount of normal two metre beacon operation. In Los Angeles, much of the DCE operation has been done without interrupting two metre beacon operation and we hope to make this "standard operating procedure" for the DCE. The spacecraft DCE software has not changed and both UoS and USA ground-station software systems are operating efficiently. The next ground-station to enter the DCE network will, very likely be, Ian Ashley ZL1AOX. Ian has long operated an OSCAR-10 command station, and he will be providing a gateway link between the DCE and the packet network in Auckland, New Zealand.

POLITE WARNING

In recent months, it has been disturbing to note that a number of stations have been observed to have downlink signals at least 12dB above the level of the Engineering Beacon. It is strongly recommended that when operating on OSCAR-10 that you monitor your downlink signal reference to the Beacon. If you are stronger than the Beacon you should turn the "wick" down and thus satisfy two fundamental requirements.

Conserve on battery power which is most important during the eclipse seasons, like now.

Not activate the AGC on the spacecraft. Whilst signals are peaking 12dB over the Beacon it means that all signals are suppressed by at least 12dB in the passband, consequently the QRP signals do not get a fair go.

It is common talk that it is always the Americans who are the villains in this matter. At times, this is correct, however there are too many VKs who are also guilty.

It is not too late to pass a belated New Year's Resolution to check your downlink against the Beacon a little more often in 1986.

RUDAK

Next month I shall commence to publish extracts from the RUDAK Draft Specification. RUDAK (Regenerativer Transponder fur Digitale Amateurfunk Kommunikation) is a digitalk experiment to be flown on the Phase-3C spacecraft due for launch in July/August 1986. However, those especially interested in the experiment (packeteers) may wish to get a copy from Graham VK5AGR, QTHR, by supplying a 120 x 235mm SASE with a small donation to cover photocopying.

de Colin VK5HI
AR

WIA 75 AWARD RECIPIENTS

372	Kenton Dean NK6F
373	Ray Lippold VK4PK
374	B W Schreuder VK2CWS
375	Keishi Murakamk JE4LPH
376	Mitsuo Morisawa JA5TX
377	A J Odgers VK4KX
378	Michel Rousselet FT8XB
379	Michio Okada JR7COK
380	E R Tester VK5MV
381	Carmenza Pond KB6ANC
382	Joe Horswill N6IKO
383	Hideo Ohtsuki JR7GYC
384	Rick Risley KB6DIH
385	Fred Kolb VK3CFK
386	Joe Gatt N6GHW
387	Joe Brown N7EZG
388	Peter Beechey VK3NBL
389	J G Cowan VK2ZC
390	Robert Hopkins VK2VMX
391	Jim Irving ZL2BMN
392	S C Matthews ZL2FB
393	Toshiki Iwase JE2IBV
394	Reg Morgan VK2ABM
395	F J Stirk VK2ABC
396	John Pate WB5EUC
397	Joy Collis VK2EBX
398	Val Searle ZL3GW
399	R L Natzke ZL1AYZ
400	Jose Rodrigeuz Peinado EA7EGT
401	Joseph Segona K4KUG
402	V Noble VK5AGX
403	H J Griffiths VK3CAL
404	Mick Puttick G3LIK
405	M J Matthews G3JFF
406	M J Haddon G4ZIY
407	M E Austin VK2KZ
408	Harry Petrodaskalakis VK3ABO
409	Shin-ichi Nemoto JA1TGU
410	Don Callow VK5NDC
411	Joe Schembri 9H1GY
412	John Weir VK4KJW
413	H Suyitno YB4FW
414	Ian Tyler VK3PFG
415	D W Olley 3D2DW
416	Eugene Nosowicz WA2UKA
417	Peter King VK2QK
418	Takashi Hosokawa JA3UCO
419	Ross Forbes FO0FB
420	Gilbert Griffiths VK3CGG
421	Richard Bowyer VK5NRB
422	A Franklyn Pain VK2DYP
423	Alex McDonald VK4TE
424	Reg Sargent VK2HM
425	Kojiro Mizuno JJ2GKA
426	G L Mills G3EDM
427	Ned Paton VK2MMP
428	Graeme Whitehead VK4NYE
429	J R Kemp VK3CAY
430	Kevin Bell ZL1ANI
431	Tetsuo Sakiyama JI3UIH
432	Masanori Uematsu JK3SAY
433	Owen Hunt ZL2AWR
434	W I Northeast VK5NOT
435	Peter Haines ZL4LD
436	Manabu Ishitani JR7UCA
437	Eizi Ishitani JR7UCB
438	Hisako Ishitani JR7UCC
439	Patrick Williams ZL2BG
440	Maurice Potter VK7SA
441	Allan Johnston ZL2BPV
442	Mitsuo Nakano JR5HCU
443	Kiichi Shimojima JA9MQ
444	Ben Jones WIA-L3O377
445	Gene Clark W6DOH
446	Joseph Xuereb VK2NS
447	Brian Major VK2JBM
448	Ambrose Coman VK3VAC
449	William Matthews VK3WJ
450	Roy Mahoney VK4BAY
451	Jonathon Marshall VK3PRN
452	R F Moore VK5ATU
453	Disabled Radio Amateurs Club VK3ZZ
454	Joan Sutherland VK3NLO
455	L E Wraight VK3ALT
456	Mary Ketzler KA0MX
457	A J Brean VK6SY
458	H Iman-Sulaiman YC1DOA

Certificates numbered 75A have been issued to the WIA Federal Executive and each WIA Division which qualified for the award while activating the commemorative call sign VK75A.

The Uranga Convention will be held over the Easter Weekend.

ANNOUNCING THE

LUCKY DOOR PRIZE WINNERS . . .

1st J Payne (Ticket A1)
2nd B Astbury (Ticket A54)
3rd C Elliott (Ticket A69)

CONGRATULATIONS TO YOU LUCKY PEOPLE

NEW ! ! PCS—5000

THE BRILLIANT NEW PCS-5000 2-METRE FM TRANSCEIVER C-MOS TECHNOLOGY AT ITS FINEST!

The Azden PCS-5000 features unprecedented wide frequency coverage with separate or simultaneous scanning, two ranges of programmable bands, 25W output, 20 channel memory and much more.

WE STOCK THE LARGEST RANGE OF AMATEUR RADIO EQUIPMENT IN AUSTRALIA!

COME AND SEE US — WE ARE EVEN OPEN ON SATURDAY MORNINGS

ICOM

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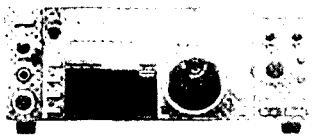

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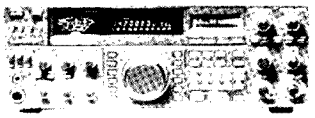

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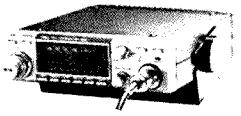

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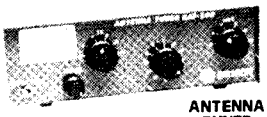

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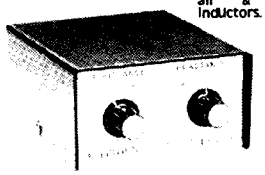

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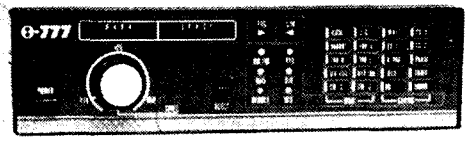

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Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

MARCH
1- 2 *ARRL DX Phone Contest (Rules January issue)*
8- 9 *QCWA Phone QSO Party (Rules February Issue)*
8- 9 *Commonwealth Contest 1986 (Rules January issue)*
15-16 *Bermuda Contest*
15-16 *YL-ISSB Contest (Rules February issue)*
15-16 *John Moyle Memorial Field Day Contest (Rules this issue)*
22-24 *BARTG Spring RTTY Contest*

APRIL
5- 6 *WW SSTV Contest*

MAY
27-26 *1986 CLARA AC/DC "Mystery" Contest (Rules this issue)*

It may be anticipated that the Polish CW and Phone Contests will be held during April and looking further forward, I would expect that the CQ WW WPX CW Contest will be held during May.

VK NOVICE CONTEST 1985

This year, 1985, VK5NOD proved too much for the opposition with a composite top novice score on Phone and CW, his total being 739 points. Congratulations to **VK5NOD** who, having won the Keith Howard VK2AKX Trophy for his performance in 1984, will thus hold the Trophy for another period. Perhaps in June, we may see a real battle go on amongst the novice operators in an endeavour to wrest the Trophy away from the south east of South Australia.

You may note my reference to the fact that the winning score is stated as a composite of the Phone and CW score. At the 1985 Federal Convention, my report included the proposal that the winner of the Keith Howard VK2AKX Trophy must have submitted both a Phone and CW log in the contest. This proviso has been written into the rules and I must therefore again emphasise that the trophy can only be won by an operator entering both the Phone and CW sections. I do not have very much more in the way of comment on the contest this year except to say that the number of novice operators entering the CW section was most disappointing.

Virtually all of the letters received with logs submitted made comment on the lack of novice operators on CW. In fact, some were somewhat critical in their content regarding novices passing the test and then dropping CW altogether. Some suggested that the qualifying speed for the novice examination should be increased so that when the operator finally went to air, he might have that little more skill and confidence. One other comment made was to the effect that here are people who are constantly clamouring for additional privileges and yet they apparently are not capable, in the main, of meeting the current requirements of the licence they now hold, otherwise more of them would be displaying their proficiency and their improvement over the basic standard in CW operation.

So, it's over to you! Just what is your opinion? I certainly hope that if you decide to express same, you will do so in a rational manner and not let yourself become carried away with emotional argument. Once again, I might point out that the only evidence I can provide is that contained in the contest results, which certainly seem to bear out much of what is contained in the criticism I have received.

I might finally comment that most of the logs submitted were of good standard with some particularly neat logs, obviously computer generated, such as from VK2CZX and VK5NEW, whilst some excellent manually produced logs were received from stations such as VI5ALE, a club entry operated by Carol VK5PWA, and the entry provided by Len VK3NLS.

I must also mention the excellent manually produced log submitted under the call sign VI5JSA, the South Australian Jubilee call sign, which was operated by John VK5SJ. With the special call sign, he scored the highest single entry with 758 points and deserves a special mention as overall top scorer in the contest.

Here now are the full details of individual scores.

VK NOVICE CONTEST INDIVIDUAL SCORES FOR 1985

PHONE/ NOVICE		PHONE/FULL CALL		CW/FULL CALL	
5NOD	691	2CDS	694	3CGG	139
3PDG	668	5BJA	632	VI3XB	130
3PFG	531	2KL	603	VI3KS	105
5NEW	518	5QX	388	5AGX	101
7NCP	515	3YZ	365	2PS	86
7NAI	486	2CZX	358	4BRZ	62
3NLS	481	3CQP	336	4XW	58
3PRN	291	2EZB	268	5GZ	34
4NUN	291	5FF	266	2BQS	32
4NHF	269	2BQS	235	4TT	31
5NRB	260	1LF	185	5QX	20
3VDG	212	VI3KS	120	5FF	19
7NBF	211	5GZ	115	3XF	8
3KCT	170	4AOE	100		
5NIA	164	VI3XB	99	**PHONE/CLUB**	
		3XF	97	VI5JSA	758
CW/NOVICE		5AGX	91	4WIC	365
4NUN	98	6ATE	47	1BBA	281
2PUG	92			5BAR	268
5NOD	48	**CW/CLUB**		VI5ALE	73
3PDG	4	4WIC	15		
		LISTENER			
		L30396	616		
		L30371	84		
		L60036	81		

NOTE: All call signs are VK except where stipulated.

Total contest entries: 38 phone; 18 CW; three SWL. (12 combined Phone CW and six Club). Grand Total — 59. This compares with a total of 40 entries in the 1984 contest.

Well, that is about all for this month. Maybe a shorter column this time will make up for the extremely large number of pages submitted last month. I can certainly do with more time available with so many matters to keep under consideration. By now, I would hope that you will have discussed thoroughly within your Divisional organisations any business you want aired at the coming Federal Convention and properly briefed your representatives on such subjects.

In the meantime, I will be busy preparing my annual report and recommendations to the Federal Council. I would trust that there will be little in the way of contentious matters dealing with contests this year.

I would also hope to have a contact with you during the John Moyle Memorial Field Day Contest, although I will only be able to take part in the six hour section.

If you run across my call sign you may wish to provide a **brief** comment or two, about the contest and like matters, although if business is brisk I will, no doubt, be appreciative if you can wait for a quieter spell. By the way, I would certainly be interested in receiving any photographs of Field Day operations for publication in the magazine. I received a lovely photograph from Gill VK6YL, last year. She was standing in front of the wind generator.

Meanwhile, I wish you all good luck with your contest operations.

73 de Ian VK5QX.

CLARA AC/DC MYSTERY CONTEST 1986

This contest is sponsored by the Canadian Ladies Amateur Radio Association. It starts at 1800UTC on Tuesday 27th May and concludes 1800UTC, Wednesday 28th May 1986.

The AC/DC Mystery Contest is open to all YL and OM amateurs. Each CLARA station may be worked twice, once on CW and again on phone, the same mode on two different bands. Exchange name, serial number beginning with 001, RS/T, QTH, and if a CLARA member. Three unidentified "Mystery" stations will be operating during the contest.

Suggested frequencies for phone are: 28.488; 28.588; 21.300; 14.160; 14.280; 7.150; 3.775 and 3.900MHz.

CW frequencies are: 28.035; 21.035; 14.035; 7.035 and 3.690MHz.

VK stations note some of these frequencies are outside our bands.

All contacts must be made in accordance with operator and station regulations. No net, lists or cross-mode contacts.

Scoring — for the base score, CLARA members score one point per contact with non-members, two points per contact with CLARA member, three points for every CW contact.

Non-members must work CLARA members only. For base score count two points per contact, three points for each CW contact. Multiply the base score by the number of Canadian Provinces/ Territories worked for the total score. The Contest Manager will add ten points to the base score of each log for every Mystery station worked.

DX station winners will be eligible for a certificate.

All logs submitted are eligible for the Mini-Prize draw. Logs must show Date/Time UTC; Band; Mode; Call Sign Worked; Report and Serial Number Sent; Report and Serial Number Received; Name of Operator Worked; QTH and Points Claimed. Logs also to show full name, call sign and address of operator, and full score claimed. No carbon copies. No logs will be returned. Contest Manager's decision will be final. Logs must be received by 15th July 1986.

Mail logs to the Contest Manager, Muriel Foisy VE7LQH, RR # 1. Pender Island, BC. Canada. V0N 2M0. **AR**

H F PACKET RADIO

David Pilley VK2AYD
15 Forest Glen Crescent, Belrose, NSW. 2085

For those interested in HF Digital Communication, the following frequencies are referenced and appear to be used world-wide: *7.097; 10.147; and 14.103MHz.* The most active is by far 14.103MHz.

Locally in Australia, 3.630 and 3.642MHz have been referred to but, as yet, the writer has not heard any active Packet operations on these frequencies.

The protocol used is Amrad AX-25 — older equipment uses Version 3.3, whilst the more advanced use Version 5.5. Both are compatible.

Stations in the USA use only 300 Baud on HF and operate on LSB but Australia, New Zealand and elsewhere also use 1200 Baud, USB, on 14.103MHz. This is quite convenient as it permits two QSOs or more to take place on the same frequency, which is really being frequency-conservative.

During December 1985, the following stations were heard or worked on 14.103MHz: *VK2AQG*; YJ8RG*; VK2AYD*; ZL1AOX; VK2BBD; JA1DSI; VK2BIS*; VK2BVD; VK2BVS*; and VK2HL.*

* denotes stations which are known to operate on both 300 and 1200 BPS.

Both YJ8RG and JA1DSI operate beacon stations and YJ8RG is on most evenings around 0700UTC.

The JA1DSI beacon is only on 300 BPS LSB 14.103MHz and reads:

Beacon JA1DSI. This is JA1DSI in Suginami Tokyo AX.25 V3.3.

Remember, if you do put out a beacon it is necessary to keep the characters short, no more than 40 are recommended as weak signals become very hard to decode.

The writer would be interested to hear from other stations that are active with packet radio in Australia and New Zealand. Please write to the above address or contact the writer on air. **AR**

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton. SA. 5014

A brief summary of the award program of Reseu des Emetteurs Francais will be given in the column this month. However, I can supply the complete leaflet on receipt of a self-addressed envelope.

The first, *Diplome des Departements Francais de la Metropole (DDFM)* is for working 40 or more departments out of a total of 95, the department number being given by the first two digits of the five-figure post code.

Diploma des Provinces de France (DPF) may be claimed for contacting all 22 provinces — a province is a group of two or more neighbouring departments. The REF leaflet has a full list.

Diplome de l'Univers Francophone (DUF) is for QSOs with countries which had, or still have French connections, ranging from DUF1 (five countries in three continents) to DUF4 (20 countries in six continents).

These three awards have five-band and SWL versions.

AUSTRALIAN DXCC NEW MEMBERS (since the last listing published in AR, July 1985).

Number	Call Sign	Name	Countries
PHONE			
333	ZS5CO	*Rag Sweet*	104
334	VK4VIS	*Noel Cagney*	100
335	VK3IR	*K M Maroney*	103
336	VK5GZ	*Lindsay Collins*	100
337	YB0BZZ	*E Suryadarma*	195
339	VK4ATQ	*Brian Pittman*	119
340	VK4KHZ	*Bill Wallace*	121
OPEN			
228	VK4KHZ	*Bill Wallace*	125
229	VK6HQ	*J L Hawkins*	107
230	VK3CNF	*Norman Fairweather*	112
231	VK3DP	*John Kelleher*	104
232	VK2COP	*Bill Martin*	102

There were no CW or RTTY applications for this award.

WIA VHF AWARDS (since last published in AR, July 1985)

These are *Worked All States (VHF)* which was first issued in October 1949; *VHF CC* which was first issued in January 1962; and *Worked All VK Call Areas (VHF)* first issued in January 1973.

Until recently, all awards issued were for six metre contacts, but now the two metre barrier is being overcome. I gather from those who were around at the time, that it was originally envisaged that VHF DX-peditions might have to be made to mountain tops and to State borders to secure these awards. On two metres, VK8 was the stumbling block for some years. At length, Steve VK4ZSH mounted two expeditions to the Northern Territory border and was successful in working VK6 and VK8. He received the WAS (VHF) two metre award in April 1984. Others adopted the voluntary restriction of working only from their home-base stations, and they also have now successfully Worked All States on two metres. Congratulations to Colin VK5RO; Eric VK5LP and Ken VK3AKK on achieving your objective after 25 years.

Number	Call Sign	Name	Band
WAS (VHF)			
160	VK5RO	*Colin Moore*	Two
161	VK5LP	*Eric Jamieson*	Two
162	VK3AKK	*Ken Jewell*	Two
WAVKCA (VHF)			
25	VK4VP	*E Penikis*	Six
28	VK2ZRU	*R Usher*	Six

There were no applications for VHF CC.

RNARS AWARDS

The Royal Naval Amateur Radio Society sponsors five awards which are available to non-members.

MERCURY AWARD

This award is to encourage radio activity between members and other amateurs. One point is gained for each contact with a member per band, with two points for special event stations, such as GB3RN. For VK stations, five points is enough for the basic award, and band/mode endorsements are available. Send log extract and one pound to the Mercury Award Manager, Don Walmsley G3HZL, 3 Meon Court, 609 London Road, Isleworth, Middlesex, England.

HAMPSHIRE COUNTY AWARD

This is for contacts between stations in the county of Hampshire and other amateurs. Again, for VK, five points gains the third class award, one point per station contacted. Send log extract and one pound to Don Cawley G2GM, Bay Sound, Freshwater, Isle of Wight, England.

WORLD-WIDE AWARD

This is gained by working RNARS members in 10 countries in at least two continents (basic award). Log extract and one pound 50p to Mark Mullins, 24 Rigby Close, Waddon, Croydon, DR0 4JU, England.

ENDEAVOUR AWARD

This award is for contacting RNARS members residing in Australia. Scoring is one point per member contacted, per band, with two points for VK3RAN. VK amateurs need 15 points for the basic award. Log extract and $1.50, or seven IRCs to the Award Custodian, Ron Catmur VK5PY, 142 Woodford Road, Elizabeth North, SA. 5113.

HMAS CANBERRA AWARD

Finally, in this group, the HMAS Canberra award requires 10 QSOs with at least four VK1 RNARS members, and one special station VK1RAN or VK3RAN. Log extract and 10 IRCs to Barry Bennetts VK1BB, 48 Chuculba Crescent, Giralang, ACT. 2617.

The World-Wide and Endeavour Awards are available to SWLs also.

KUWAIT AWARD

This award is sponsored by the Kuwait Amateur Radio Society and is available to amateurs and SWLs for contacts with/reports confirmed by 10 different Kuwait stations. Any authorised band/mode may be used, and there is no date limitation, but all contacts must be from the same location; vis within a radius of 100km from the original location, and using the same call sign. A list showing full details of contacts, certified by the award manager or secretary of a national society should be sent, together with five IRCs to the Award Manager, Kuwait Amateur Radio Society, PO Box 5240, Safat, Kuwait, State of Kuwait.

ROYAL JORDANIAN AMATEUR RADIO SOCIETY

Did you work five Jordanian stations using the prefix JY50 during the 50th birthday celebrations for His Majesty King Hussein? If so, you are eligible to receive a commemorative certificate. The special prefix was used during the period 7th-21st November 1985. A certified log extract and 10 IRCs, or US$5 is all that is required to the Royal Jordanian Amateur Radio Society, JY50 Celebration, PO Box 2353, Amman, Jordan.

AR

EXPO 86

Noted Norwegian explorer and anthropologist, Thor Heyerdahl will be a key speaker at the third Expo 86 symposium on 8 and 9th May 1986. Dr Heyerdahl in known for his Kon-Tiki, Ra and Tigris voyages. In 1947, he crossed the Pacific on a balsa wood raft to prove the theory that Peruvian Indians could have settled in Polynesia.

From 7-13th September, an international conference on satellite and fibre optics communications, along with a computer exhibition will be a feature at Expo.

WICEN News

NDO ANNUAL EXERCISE COMCOORD 85

WICEN participated in the annual Natural Disasters Organisation Exercise COMCOORD 85, which was held last November. The exercise scenario involved simulated natural disasters in the Northern Territory and Queensland. A cyclone situation was portrayed for Darwin and a 'Jumbo" airliner crash in outback Queensland. Due to the sensitive nature of these scenarios, should messages get misconstrued, amateur radio involvement was limited to a communications demonstration and passage of Innocuous, yet factual reports. The net ran for over three hours and passed a number of messages satisfactorily achieving the WICEN aim.

Thanks are due to VKs: *1DG, 1ZAH, 4WI/4KD, 4ACU, 4AQU, 4AGQ, 4OV, 4LZ, 4QL, 4IQ, 4UX and 8HA* for devoting time and effort to this exercise on a work-day afternoon.

CHANGES TO WICEN CO-ORDINATORS

The SA Divisional WICEN Co-ordinator changed from John Mitchell VK5JM, to Bill Wardrop VK5AWM, in October 1985, and the WA Divisional Co-ordinator exchanged from Syd Jenkins, to Jack Shurmer VK6QS, in June 1985. It is worthy to note that Syd gave nearly nine years service to the position, thanks for the effort.

WICEN 80m CALLING FREQUENCY

It has been brought to my notice that the 80 metre WICEN calling frequency adopted at the last Federal Convention, namely 3.600MHz, is also the switch on default setting for a number of microprocessor controlled transceivers. These operators appear to have a habit of switching on and calling *HAARLQ* to check their RF output and VSWR? before listening on the frequency. This is distracting to WICEN and, furthermore, makes the frequency a very popular one to call CQ on. Consequently, it has been suggested the WICEN Calling Frequency be changed to 3.605 or 3.610MHz. *Any views on this proposed change would be appreciated.*

AR

QSP

AVIATION SATELLITE LINKS

The International Maritime Satellite Organisation, INMARSAT, planned to have up to nine new satellites in orbit in the next decade.

INMARSAT was set up as an inter-governmental agency in 1979 to create a global satellite communications system for shipping.

It now has 44 member nations and is developing a second generation of satellites capable of handling aviation as well as maritime communications.

An aeronautical satellite network could also enable airline passengers to make phone calls or use their personal computers while flying anywhere except over the polar icecaps.

This is the sort of service currently available through INMARSAT's maritime communications network which provides voice, data and facsimile links to 4 000 ships and oil rigs world-wide.

It is now moving into aeronautical satellite communications which will provide airliners with improved communications for weather, and air traffic reports in areas where conventional radio reception is poor.

Computers on board airliners could also be linked via satellites to earth stations, making flight recorders virtually redundant by providing a ground monitor of all information stored in them.

Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Already a quarter of the year has nearly gone! Time literally slips away from me these days. Conditions have improved a little, yet there are the occasional days when there are ionospheric disturbances. We now have entered into the autumn phase, with the major international broadcasters making their seasonal alterations to their frequency schedules. The M-86 period commences on Sunday, 2nd March, at 0100UTC. This period will last until 4th May.

SEVERE IONOSPHERIC PROPAGATIONAL DIFFICULTIES

As I am compiling these notes in mid-January, it is too early to predict what conditions should be like. I would expect though, that the higher frequencies, such as 21MHz, will have dropped off in our local evening hours. We will also be hearing signals coming from the Long Path (LP) much earlier, particularly on the lower frequencies at around 0530UTC.

Because of severe ionospheric propagational difficulties, the BBC External Services made substantial alterations to their Australasian services. They have commenced utilising their Singapore Relay Site to broadcast to this region from 0600 to 0915UTC. Simultaneously, they dropped their old faithful channels of 5.975; 7.150 and 9.640MHz, all from UK sites. The Kranji relay can be found on 11.955 and 15.360MHz. The latter channel is putting in remarkable signals to SE Australia. However, 11.955MHz is a little disappointing, yet I am reliably informed that it may be putting in good signals in Western Australia; Northern Territory and possibly Queensland. The 15.360MHz channel, however, seemingly hold-up very well. 11.955MHz is fairly weak, with a station broadcasting in Japanese language co-channel.

BUDGETARY CUT-BACKS

Incidentally, the service on 15.070, which comes in very well later in the evening hours, is continuing to be excellent. I find that 17.790MHz can also put in quite good signals, although it is primarily beamed to Africa and South Europe. The Kranji Relay on 11.750MHz is disappointing, with Radio Beijing causing splatter from 11.755MHz between 0900 to 1025UTC.

The BBC External Services recently came to the rescue of Greenwich Mean Time. Because of budgetary cut-backs, the Royal Greenwich Observatory, in Surrey was unable to purchase replacement tubes for their Caesarloum clocks. The BBC has been broadcasting the Greenwich Time Signals since 1924, and decided to help the Observatory with finance to help it get these tubes and continue their service of time signals for the next five years. It certainly would have been very unusual for the time-pips from Greenwich to disappear from the "Beeb". Incidentally, it is true that the chimes from *Big Ben,* that one hears on the quarter-hour are live and not recorded. There is a microphone within the clock tower and you can occasionally hear extraneous noises from the nearby Westminster traffic, in the background. When restoration work was going on in the Clock Tower, the sounds of hammering and sand-blasting were clearly audible.

TALKBACK

Peter Wolfenden VK3KAU, who has an occasional segment over Radio Australia's *Talkback,* has forwarded me the current times for this program. You can hear it on Saturdays at 0310; 0810; 1330; 1612 and 2112UTC. If you would like details of Frequency Schedules,or a Program Guide, I do suggest you contact Radio Australia, GPO, Box 428G, Melbourne, Vic. 3001.

The Australian Radio DX Club can now be contacted at 404 Mont Albert Road, Surrey Hills, Vic. 3127. This is the official address until further notice and is due to postal difficulties they have been encountering of late.

FREQUENCIES AND TIMES

The 22 metre international broadcasting allocation is seemingly alive with plenty of signals, although it was not officially to come on stream until 1989. The USSR has been the one to make extensive use of this allocation, but now other nations are rapidly gearing themselves up to use the new allocation. Here are the details of known stations operational on the allocation from 13.600 to 13.800MHz. At present, there are quite a number of utility services also occupying this allocation as well.

13.605 Vladivostok — 0800-0900UTC Orbita-5 programs in Russian.
Prague — 1630-2125UTC in Arabic, English and French, to Africa.
13.615 Dacca — 0630-0830UTC in Bangla and English
13.625RM Yerevan — 0430-0500UTC Hausa, 0500-0700UTC W/S to Africa.
RM Novosibirsk — 0400-1100UTC in Chinese.
13.635RM Kalinin — 1000-1100UTC in German.
13.650 Pyongyang — 2200-0050UTC and 0400-1050UTC in various languages.
13.655RM Kalinin — 0700-1300UTC W/S.
13.665RM Simferpol — 0730-1500UTC W/S.
13.670 Dacca — 1600-1800UTC in Bangla and English.
RM Moscow — 0200-1030UTC various East Asian languages.
13.690RM Kalinin — 1300-1600 Indian dialects and languages.
13.700 Pyongyang — 2200-0500UTC various languages.
Baghdad* — 0400-1000UTC in Arabic.
13.705RM Simferpol — 0700-1430UTC with W/S.
13.715 Prague — 1430-1625UTC In English and Czech for Asia.
13.725RM Moscow? — 1330-1500UTC in SE Asian languages.
13.735 Moscow SSB Feeder — between 0600-1400UTC in Russian with Domestic Relays.
13.770RN Flevoland — 1430-1525UTC English and 1530-1625UTC Arabic.
13.797 Reykjavic Iceland — 1215-1245UTC In Icelandic to Europe and 1315-1345UTC to North America. Only 3kW, also USB. Good catch if you hear it!

The following information came from the January issue of *ADXN* and from my own listening, to which I am indebted for the sites for RM.

** Baghdad is also on 9.610MHz from 0400 and from 0600 on 9.745MHz simultaneously, with domestic programs.*

Well that is all for this month. Until next time, the best of listening and 73 — Robin.

AR

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

I begin the column this month by thanking the people who gave active support to the Intruder Watch in December 1985. They were: *VKs 1NET; 2BQS; 2KPI; 2PS; 3XB; 3XU; 4AKX; 4BHJ; 4BN; 4KHZ; 5BJF; 5GZ; 5TL; 7RH and Mr G H A Bradford.*

TAXI DRIVERS IN ASIA

You may remember last month, I mentioned a problem which has appeared on the 28MHz band, and which, if left unattended, could well become a major problem in the future. I refer to the activity on that band by taxi drivers in Asia. A note from Bob ZL1BAD, the IARU Monitoring System International Co-ordinator, tells me that he has made overtures to David Rankin 9V1RH/VK3QV, Chairman of IARU Region 3, to have the Hong Kong Amateur Radio Society look into the matter.

Lindsay VK5GZ, the VK5 IW Co-ordinator, has reported activity from a station on CW signing XSG/3/4/7, etc. This station is Shanghai Radio, which is a fixed coastal station, and shouldn't be appearing on 21.059MHz.

STATISTICS FOR DECEMBER

Statistics for December 1985 are as follows:

312 broadcast intruders; 151 CW intruders; 135 RTTY intruders; 79 other modes and 73 intruders identified.

Also, Steve VK2PS, was worried about a carrier appearing on 28.282MHz, which he could not track-down as a listed beacon. However, he subsequently discovered that it is indeed VK4RTL, which Identifies in FSK.

AWARDS

I am pleased to hear from Col VK4AKX that both Gordon VK4KAL, the VK4 IW Co-ordinator, and Norman VK4BHJ, a stalwart of the Intruder Watch, were both recipients of the WIA 75th Anniversary Medallion. Congratulations to both of you!

PERSONALLY SPEAKING

Just a couple of personal items to mention in passing. I am very nervous at the moment as I have 109 OSL cards en route to the USA to the ARRL . . . I hope they make the return journey okay as I wouldn't like to have to go and get them all again. And also, I can tell you that you don't know what the word *apprehensive means until you have an intermittent fault in your computer! (which I have). Sure is exciting — or is that the right word?*

WHERE DO THE MAJORITY OF 7MHz INTRUDERS COME FROM?

Radio Tirana, on 7.090MHz, is now sharing the frequency with Radio Pakistan . . . (this column is becoming more of a short-wave-listening column . . . whatever happened to the amateur allocation of 7.000 to 7.100MHz ? ? ?).

Jamming stations still prolific on 7MHz . . . the Vee beacon is still being heard on 7.003MHz . . . Col VK4AKX observes, and correctly, that 99 percent of intruders on the 7MHz band come **from Russia** — surprise, surprise. I have often said, *"If the USSR would observe the regulations, we would have almost nothing to worry us on the amateur bands, and could get on with the business of trying to contact other amateurs".*

Keep trying for the Intruder Watch Net on 3.595MHz, on Wednesday evenings at 1000UTC, when daylight saving is in effect, and 1030UTC Australian Winter Time.

See you next month, and please think of the Intruder Watch if you hear something that shouldn't be on the amateur bands.

AR

A R Showcase

TELESCOPIC MASTS

The Clark Masts QTM and SQTM series are very lightweight, air-operated telescopic masts. They may be extended by handpump, attached or remote, or when vehicle mounted, by battery powered power pack. They are normally not rotatable and may be locked when extended.

Eighteen models are available in all QTM ranges, from 4 to 12 metres, with headload capacities up to 10kg. SQTM range up to 15 metres with 10kg headload. The approximate weight of a mast with handpump is between 6 and 20kg. These masts have many applications some of which are raising lightweight omni-directional antennas, temporary site floodlighting, meteorological instrument supports, forest rainfall measurement, air pollution monitoring, all forms of scientific investigations, crop spraying swath markers, accident warning high level beacons, or observation using a CCTV Camera.

For further information please contact Scalar Distributors Pty Ltd, Head Office, 20 Shelley Avenue, Kilsyth, Victoria 3137. Phone (03) 725 9677 or Branch Offices, Sydney (02) 502 2888, Brisbane (07) 395 1188 or (07) 395 1817, Perth (09) 446 9177.

AR

COAXIAL CONNECTORS

Scalar Industries now offer a comprehensive range of coaxial connectors. The range includes - 'P' push on connectors for use on small RF Coaxial cables which are used extensively on television aerial systems and electronic testing equipment, UHF (PL259) general purpose connectors for non-constant impedance for use with coaxial cables RG58, RG59, RG8, RG213, UR57 and UR67; BNC Connectors which feature a quick disconnect, bayonet lock coupling — they are small, lightweight connectors suitable for use with smaller RF coaxial cables and will operate to a peak of 500 volts and are weatherproof, TNC connectors — are screw type coupling versions of the BNC series but they have the advantage of better performance under vibration and better weather-seal since greater pressure can be exerted on the gasket by a screw type coupling nut.

The N series are a line of low voltage, constant impedance connectors for use with small and medium size RF cable, they are weatherproofed, rated at 1 000 volt peak, and are suitable for use with frequencies up to 10 000MHz.

Crimp type connectors are available in UHF; BNC; TNC; and N types and these crimps reduce assembly time and improve the complete cable assembly. Crimping is faster than soldering and cannot melt or deform the dielectric.

Scalar also have adaptors for connecting the different series connectors to one another and a range of coaxial cables.

For further information please contact Scalar Industries Pty Ltd, Head Office, 20 Shelley Avenue, Kilsyth, Victoria 3137. Phone (03) 725 9677 or branch offices, Sydney (02) 502 2888, Brisbane (07) 395 1188 or (07) 395 1817, Perth (09) 446 9177.

AR

DATA MANUALS ON JAPANESE SEMICONDUCTORS

The 1985 CQ Data Manuals, with information on Japanese Semiconductor devices have always been hard to obtain. Fortunately, IMARK Pty Ltd have again secured a limited quantity from Japan.

Brief details of the various 1985 manuals are as follows:

"The Transistor Substitution Manual" lists equivalent Japanese transistors by makers for 2SA, 2SB, 2SC and 2SD transistors. Information on whether the transistor is discontinued, principally for renewal purposes only, available by custom order only, or if the manufacture is suspended is included. (282 pages)

"The Diode Manual" provides specifications and package details for Japanese diodes and includes zener, small signal, bridge rectifier, reverse polarity and power diodes. (387 pages)

"The FET Manual" details specifications and package details on Japanese FETs (2SK, 3SK and others). Performance charts and typical circuit configurations are often supplied. (348 pages)

"The OP AMP Manual" (Parts 1 and 2) provides detailed specifications and package information for (Part 1) Analog Devices, Ancom, Brown Burr, Datel-Intersil Inc, Intech, Function Modules, Teledyne Philbrick, Zeltek, Hitachi, Matsushita, Mitsubishi, NEC, JRC, CR Box, Toshiba, (Part 2) Advanced Micro Devices, Analogue Systems, Fairchild, Harris Semiconductor, Intersil, Motorola, National Semiconductor, Philips, Precision Monolithics, Raytheon, RCA, SGS Ates, Signetics, Silconix, Teledyne Semiconductor and Texas Instruments devices. (Part 1, 375 pages, Part 2, 294 pages)

"The Linear IC Manual" provides technical specifications, and package details of Japanese manufactured Linear Integrated Circuits. Typical or suggested circuit designs are usually included with the details for each particular IC.(390 pages)

"The T.TL IC Manual" provides technical specifications, package details and lists world-wide manufacturers of the particular device. The manual includes details for 7400 series, 74SL series, and 74S series. (412 pages)

"The C-MOS IC Manual" provides technical specifications, package details and world-wide manufacturers for 4000B series, 4500B series, and 74HC series devices. Truth and timing details are often included. (327 pages)

"The Memory IC Manual" provides technical and package details, has tables of similar devices with their specifications and lists most major world-wide manufacturers devices including Japanese devices. Devices covered include Static RAMs, Clocked RAMs, Dynamic RAMs, P-ROMs, and UV-EPROMs. (382 pages)

"The Power & Industrial Semiconductor Manual" provides technical and package details as well as some typical circuits for power devices. Most devices listed are of Japanese origin. (375 pages)

"The Interface IC/Device Manual" provides technical and package details for over 400 devices used mainly with computers. Products made by Fairchild, Motorola, Signetics, Texas Instruments, AMD, National Semiconductor, Hitachi, SGS, Sanyo, Mitsubishi, Toshiba, Sprague, and NEC are listed. (221 pages)

"The A-D/D-A Converter IC Manual" provides package outlines and technical details on nearly 400 devices made by Micro Networks Corp, Beckman, Analog Devices Inc, ICL Data Device Corp, Datel-Intersil Inc, National Semiconductor Corp, Burr-Brown Corp, Matsushita, Advanced Micro Devices Inc, RCA Corp, Sony , Precision Monolithics Inc, Hitachi, Harris Co, Intersil Inc, Fujitsu, Motorola Inc, Mostek Corp, Oki, Signetics Corp, Plessey Ltd, Toshiba, TRW Inc, Telmos Inc, Thomson Semiconductors, Ferranti Electronics Ltd, and NEC. (293 pages)

While each individual manual would provide a wealth of information for technicians and engineers etc, the complete set would provide an almost complete library of information on Japanese Semiconductor devices.

The manuals are priced at $12.50 each plus $5.00 post/packing for 1-13 manuals.

Further information is available from IMARK Pty Ltd, 167 Roden Street, West Melbourne, Victoria 3003. Phone (03) 329 5433.

AR

SCANNING FULL BAND RECEIVER

The new IC-R7000 uses advanced technology to achieve continuous coverage from 25MHz to 1 300MHz. No additional module is required to achieve coverage up to 2 000MHz. CPU based optical tuning provides 100Hz steps over the entire range. This is enhanced by using a direct entry keyboard for frequencies that are known to the user or precise tuning via a rotary system that offers tuning speeds of 0.1, 1.0, 5.0, 10.0, 12.5, or 25kHz. The frequency selected is always displayed on a seven digit, dual colour fluorescent readout. The mode selected is also displayed on this readout.

The R7000 uses multi-conversion techniques for reception of FM (both narrow and wide band), AM and SSB (upper and lower). 99 memories are available to the user, each capable of recording

mode and frequency. Further, the memory can record active frequencies while in the scan mode without disabling the scan. Later, the memory may be integrated for active frequencies. Scanning may be done by mode, programmed scan, full scan, selected scan, memory channel scan, auto write programmed scan and priority scan.

An optional infra-red remote control model RC-12 will control all the functions of the R7000. This will be available shortly.

Outstanding performance of the R7000 places the radio in the professional class. The spurious and image rejection performance is better than 60dB and sensitivity is typically better than 0.5uV for 12dB sinad. The radio is powered from either 13.8V DC or mains supply. The compact size of the R7000 will invite mobile use. The IC-R7000 is a perfect companion for the now famous HF receiver model IC-R71A.

ICOM (Australia) Pty Ltd will happily provide further data on this new receiver. The address is 7 Duke Street, Windsor, Victoria 3181 or phone (03) 512284.

AR

ALFATRON

DISTRIBUTION AGREEMENT

Alfatron has announced that it has secured distribution rights to the range of soldering equipment manufactured by Zevatron in West Germany.

The range of equipment represented is from large wave soldering installations such as the MPS-300 series down to solder baths, dip pots and hand-held irons. One item that will be very attractive to potential soldering machine buyers is the MPS-200 series of modular soldering machines. This series features the patented modulated *Chip Wave* design that is unique to Zevatron equipment. This is specifically intended for Surface Mount Devices especially where the device packing density is very high.

For those interested in modern drag soldering, Alfatron is offering a free 16-page re-print describing techniques and equipment. For further information contact Alfatron, 1761 Ferntree Gully Road, Ferntree Gully, Vic. 3156, or phone (03) 758 9000.

AR

JA1YWX/JD1 SATELLITE DXCC SERVICE

***Date** — 27th March to 3rd April 1986.*
***Place** — Chichijima-I, Ogasawara (Bonin) Island.*
***Band** — 145/435MHz, A0-10 Mode-B, HF band.*
***Mode** — SSB and CW.*
***Call Sign** — JA1YWX/JD1.*
***QSL Card** — Via the Bureau or an SAE and IRCs to JM1LPN.*
***Delegate** — Yutai Katoh JM1MCF 2-21-2 Kakinokizaka, Meguro-ku, Tokyo 152 Japan.*

WIA VIDEO LECTURES NOW EVEN MORE WIDELY AVAILABLE!

FEDERAL VIDEOTAPE CO-ORDINATOR
John Ingham VK5KG
37 Second Avenue, Sefton Park, SA. 5083

Now every radio club can provide their members with quality technical lectures on subjects covering the whole range of amateur radio activities by taking advantage of the WIA Federal Videotape Library. You will find this a boon, particularly if yours is a country club which often has difficulty obtaining a variety of expert lecturers for regular meetings.

Individual amateurs and librarians should take note of the new Duplication Fees at the end of this article.

For radio clubs affiliated with the WIA, it is inexpensive and easy. Here is how it works:

*Except for those titles for which the WIA does **not** hold a copyright licence, all you have to do is . . .*

Supply the Videotape Co-ordinator with a video-cassette of an available format

Enclose another stamped, return-addressed padded mailbag and the program is free for you to use in support of amateur radio in your area . . . including copying and transmission over the air if you wish

Those programs which are copyright are available only on loan. To obtain any of them send with your request . . .

Information about your preferred VCR format

A statement signed by a responsible officer of your club that "I undertake that while (Program Title) is assigned to me, I will not allow it to be transmitted over the air, nor copied by any means whatsoever, and that I will return the same promptly after showing".

A stamped addressed padded mailbag suitable for cassettes of your preferred format.

The present available formats are . . .

U-MATIC — size 260 x 173 x 40mm, mass 900 grams (to institutions only). Standard play — one hour maximum only. Standard sound only on channel 2 (No Dolby).

*VHS — size 200 x 110 x 30mm, mass 350 grams. *Standard play four hours maximum, or long play eight hours maximum as requested. * Standard Sound — Dolby On or Off as requested. Hi-Fi FM Sound also present on all VHS cassettes.*

BETA — size 160 x 100 30mm, mass 300 grams. Standard play three and a quarter hours maximum only. Standard sound only (No Dolby).

*VIDEO 8 — size 103 x 68 x 20mm, mass 80 grams. *Standard play one and a half hours maximum, or long play three hours maximum as requested. Hi-Fi FM sound is standard (No Dolby).*

Obviously, the smaller and lighter the cassette, the less postage.

* NOTE: Be sure to request *Standard or Long Play. Dolby On or Off.*

NOTE TO INDIVIDUAL AMATEURS

Since the inception of the WIA Federal Video Service, cassettes have been made freely available to all comers, especially isolated amateurs. However, recently there has been a rapid rise in the number of requests from individual amateurs, some asking for over 10 hours of programs at one time.

Video duplication is a real-time, one-at-a-time operation for which the costs of maintenance of the equipment is not small. Obviously, the Service is much more economical if, say, one tape is seen by 30 members of a club than if each of the 30 members were to request their own personal copy. If every member of the WIA requested just *one* program, it would take about *four years* at 40 hours a week to service!

So, in an effort to encourage requests from groups of amateurs rather than individuals, from now-on a Duplication Fee of $2 per hour, or part thereof, will be payable in advance for all requests from individuals. All such fees will go towards upkeep of the duplication equipment.

NOTE TO LIBRARIANS

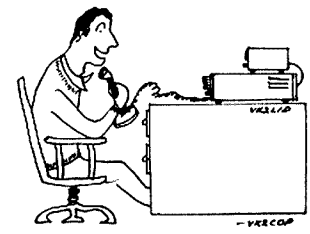
A number of educational institutions have already availed themselves of the technical lecture tapes from the WIA. While this service will continue to be available, from now-on a Duplication Fee of $10 per hour, or part thereof, will be payable in advance by all institutions not affiliated with the WIA. All such fees will go towards the production costs of future Technical Lectures.

AR

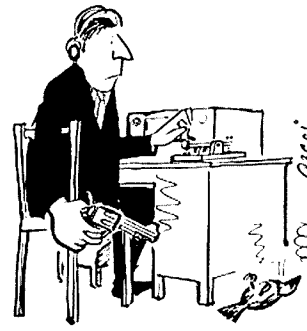
WIA VIDEO TAPE PROGRAM TITLE LISTING

NOTE:
. . . © denotes Copyright: no copy service is available.
*. . . * denotes Optically Converted to PAL from NTSC by WB2LLB — some flicker is evident.*
. . . Standard Formats: VHS and Video 8 are available on Extended Play, Dolby and Hi-Fi sound — please specify preference when ordering. Also available, Standard Beta.

	TITLE (In chronological order within each subject grouping)	LECTURER	PROD	APPROX TIME In MINs	COL/B&W	YEAR MADE/19.	DESCRIPTION & OTHER INFORMATION
GENERAL PROMOTIONAL FILMS							
—	The Hams Wide World		ARRL	30	Col	'69	*Superseded by 'The World of Amateur Radio'*
—	This Is Amateur Radio		ARRL	15	Col	'70	*Pitched at Teenagers*
—	Moving up to Amateur Radio		ARRL	15	Col	'75	*Pitched at CBers*
©	7J1RL DX-pedition		JARL	60	Col	'76	*General Amateur Radio Interest: LOAN ONLY*
—	This Week Has Seven Days looks into Amateur Radio		HSV7	25	Col	'78	*Pitched at Teenagers: includes some ARRL footage*
—	Amateur Radio — The National Resource of Every Nation		VK5KG	6	Col	'79	*Encapsulates AR: good for public exhibition*
—	The World of Amateur Radio		ARRL	30	Col	'82	*Pitched at Adult Level*
HISTORIC INTEREST							
©	Wireless Telegraphy — circa 1910		?	10	B&W	'10	*Archive Material courtesy David Wardlaw VK3ADW*
—	Opening of Burley Griffen Building — SA HQ		VK5KG	50	Col	'77	*Archive Material*
—	History of ATV in South Australia		VK5KG	30	Col	'80	*Archive Material, still building*
—	ATV in Australia 1978 — made for British ATV Club		VK5KG	30	Col	'78	*Archive Material*
—	ATV in United Kingdom 1978 — reply from BATC		G8CJS	30	Col	'78	*Archive Material*
©	Heard Island DX-peditions		Ch 2,7,9&10	20	Col	'84	*Archive Material: No Loan or Copy Available*
ANTENNAS AND PROPAGATION							
©	G6CJ's Aerial Circus	G6CJ	WIA	90	B&W	'77	*The Definitive Antenna Lecture: Loan Only*
—	Wire Antennas	VK5RG	VK5KG	40	B&W	'78	*Antennas for HF and Antenna Tuners*
—	Loaded Wire Antennas	VK5NN	VK5KG	50	Col	'80	*Using Inductive and Capacity Loaded Antennas*
—	Getting Started in Understanding the Ionosphere	VK5NX	VK5ZBD	50	Col	'83	*How the Ionosphere Aids HF Communication*
SPACE — GENERAL INTEREST							
—	Apollo 13 Disaster	VK5JM	VK5KG	90	Col	'80	*Australian Tracking Procedure Saved Apollo 13*
—	SSTV Pictures from Space — Voyager		VK5KG	15	Col	'83	*SSTV Pictures Converted from Saturn Fly- Past*
*	Amateur Radio's Newest Frontier		ARRL	24	Col	'83	*Shows "Ham in Space" — Shuttle STS-9*
—	AUSSAT — Australia's Domestic Communications Satellite	VK5JM	VK5KG	62	Col	'84	*Technical Description of Services Offered*
AMATEUR SATELLITES							
—	Getting Started in Amateur Satellites	VK5HI & VK5AGR	VK5KG	60	Col	'83	*Superseded (see below)*
—	An Introduction to Amateur Satellites (Part 1)	VK5AGR	VK5KG	60	Col	'84	*An Overview of Amateur Satellite Operation*



"I don't need an intercom in the house — I just transmit on 20 metres and they hear me on the television". — VK2COP



". . . dnt xpect u will hr any chirp nw . . ." — The Shortwave Magazine

. . . Continued from previous page

—	Micro-Computer Aids to Satellite Tracking (Part 2)	VK5AGR	VK5KG	30	Col	'84	*Programs for Tracking and Decoding Telemetry*
—	Using Phase 3 Amateur Satellites	VK5HI	VK5KG	90	Col	'84	*History, Construction and Use of High Orbit Satellites*
—	The AMSAT OSCAR Phase 3 Story	Dr Kart Meinzer DJ4ZC	VK5KG	80	Col	'85	*"The Father of OSCAR" includes film of the Launch*
DATA TRANSMISSION							
—	Getting Started in Amateur RTTY	VK5JM	VK5KG	85	Col	'83	*RTTY using Teleprinters and Micro-Computers*
—	Amateur Packet Radio	VK5AGR	VK5KG	60	Col	'84	*Theory and Demonstration*
AMATEUR COMPUTERS							
—	Demonstration of VK5RTV's Micro-Computer Controller #1	VK5KG	VK5KG	10	Col	'79	*First Micro-Computer Controlled Repeater in Australia*
—	Understanding Micro-Processors	VK5PE	VK5KG	60	Col	'80	*A Somewhat Dated Technical Description*
—	An ATV Ham-Shack Micro-Computer	VK3AHJ	VK3AHJ	10	Col	'81	*Describes now unavailable Micro-Computer Kit*
—	Getting Started in Amateur Micro-Computers	VK5IF	VK5KG	33	Col	'83	*Demonstration of Hard- and Software for Amateur Radio*
AMATEUR TELEVISION: Technical							
—	The Signal to Noise Story	VK3ATY	VK3AHJ	45	Col	'82	*Superseded by "UHF Pre-Amplifiers" (see below)*
—	UHF Pre-Amplifiers	VK3ATY	VK3AHJ	45	Col	'83	*Explanation and Demonstration of Low Noise Pre-Amplifiers*
—	Getting Started in Amateur Television	VK5KTV	VK5KG	55	Col	'83	*How to Set-Up an Amateur Television Station*
—	Testing Amateur Television Transmitters	VK5KG	VK5KG	50	Col	'83	*How to Correctly Measure Amateur Television Systems*
•	High Definition Television Tutorial	Don Fink	WB2LLB	60	B&W	'83	*A Look at What is to Come in Broadcast Television*
•	ATV Hamfest, York Pennsylvania, September 1983	Various	WB2LLB	360	Col	'83	*Various ATV Technical Lectures from USA*
AMATEUR TELEVISION: Activity							
—	ATV in Australia 1980/81 — Made for British ATV Club		VK5KG	60	Col	'80	*Clips from ATV Groups in VKs, 3, 4, 5, and 7*
—	ATV in United Kingdom 1978/81		G8CJS	30	Col	'81	*Re-make of their Previous Effort*
•	CQ ATV DX International 1983		WB2LLB	60	Col	'83	*ATV in USA and Europe*
	ATV in Victoria, 1984		VK3AHJ	54	Col	'84	*Courtesy of "The Roadshow Gang"*
AMATEUR TELEVISION: General Interest							
—	Low Definition Television	Chris Long	VK5KG	25	Col	'82	*Re-Creation of Television as Transmitted by Baird*
•	Overseas Television Clips about Amateur Television, etc		WB2LLB	60	Col	'83	*Broadcast Television Clips from USA and Europe*
—	Model Aero-Nautical Mobile ATV	VK5GO	VK5KG	6	Col	'83	*Amateur Television Camera and Transmitter Mounted in a Model Aeroplane*
MISCELLANEOUS							
—	An Auxiliary Battery Charger	VK5NX	VK5KG	30	Col	'81	*Charging a Second Mobile Battery*
—	Lecture — Winning Fox-Hunts	VK5TV	VK5KG	45	Col	'81	*How to do it from one who has!*
—	Getting Started in Amateur Construction	VK5AIM	VK5KG	50	Col	'83	*Mechanical Hints for Novice Constructors*
—	Communication Consequences of Nuclear War	Dr John Coulter	VK5ZBD	60	Col	'83	*Why Your Gear May Not Survive, Even If You Do*
—	The Far Eastern Broadcasting Company		VK5KG	60	Col	'84	*How a Shortwave Broadcaster Operates*
—	The Australian "Over the Horizon Radar"		VK5KG	60	Col	'84	*How the 'Australian Woodpecker" Works*
—	What to Expect When the Radio Inspector Calls	Geof Carter	VK5KG	34	Col	'84	*Geof is a Department of Communications Field Officer*

EVOLUTION

What's happened to our QSO's?
When we used to chat awhile.
Everything's a net now-a-days
You must join or you're out of style.

I've nothing against working DX
got myself going too for that game.
Nostalgia tells me I started too late
My intestinal fortitude is not the same.

Everything nowadays is hurry up
I could be falling far behind.
My intuition tells me get going again,
Carrying on keeps alert your mind.

Now all the young must do their share,
Like we oldster's did years before.
If you want stories about the long ago
All we oldie's can tell tales galore.

We all have had our haying days,
We're not permitted to go through it again.
So we reminisce in memories,
About our starting away back when.

In radio the coveted honor role
I won't have time on either CW or Fone.
But day by day just try my best, till
The Lord bids it's time to come Home.

Destined to fill an infinitesimal spot
But with the rulings of our FCC.
The Lord says no earthly possessions,
but will I still be old W6ABC?

— W6ABC, Newton R Wimer
— Spark Gap Times, May-June, 1985.

Contributed by Sam Kaufman VK2SK

AR

COMPUTER BUFFS

Please remember, when submitting computer programs for publication in Amateur Radio, to use your blackest ribbon on your print-out. It is preferable to use the print-out directly in AR, as this alleviates errors developing.

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER

56 Baden Powell Drive, Frankston, Vic. 3199

For those of you interested in figures, here are the statistics for the November examinations. (For those not interested in figures — skip the table but please read the rest of the column).

STATE	AOCP		NAOCP	
	NO SITTING	% PASS	NO SITTING	% PASS
VK1	11	18.2	10	40
VK2	63	30.1	67	28.4
VK3	102	27.5	84	54.8
VK4	65	27.6	60	51.6
VK5/8	61	24.6	53	30.2
VK6	56	33.9	30	23.3
VK7	13	30.8	9	33.3
TOTAL VK	391	28.4	313	40.3

These figures are, on average, down on the pass rates for AOCP and up on the pass rate for NAOCP as compared with the August examinations.

This time, however, I have been able to have a good look at the papers used. I cannot find any significant differences between the standards of the individual papers used at each level. Admittedly, this is 'feeling' only — no actual statistical analysis has been made, so I find it hard to account for the differences between States. I think I have said this before.

Comparing the two levels of exam, I have the 'feeling' (again) that the NAOCP exam may have been more difficult than some previous papers in that more questions related to topics most candidates find more difficult to grasp. However, information gathered during our work on the Study Guide suggests that most instructors are giving attention to these topics in a fair degree of depth.

The aspect that concerns me most, is the consistently low pass rate for AOCP/LAOCP. I cannot believe it is due to the exams being set at too high a level, or to the poor quality of the papers. Overall, I could find little fault with the papers. Until we have a fully detailed syllabus at each level, there will inevitably be an occasional question which some consider to be on a 'fringe' area of the course.

Now, for the commercial. I would very much like to have more feedback from those helping candidates to prepare for the exams. I do get some by listening around the bands, but this is not enough. By the time you read this, the February examinations will be not long past. Please, if you have been involved with a class, or even a single student, drop me a line with your comments on candidate's opinions of the papers and, more importantly, compare the results with your expectations of the candidate's abilities.

If there are suggestions that questions asked have been outside the syllabus, let me know so I can track them down, and so we can assess whether, perhaps, those topics should in fact be included.

I have mentioned previously that our Study Guide for the NAOCP is almost ready. For the Guide for AOCP I would like to have much more input from Divisions and individuals. The revised syllabuses are available in leaflet form from DOC Offices, or from me — so please have a look and let me have your ideas on some of the sections.

Incidentally, the revised syllabuses will be used for the exams in May and thereafter.

I am still trying to maintain an Education Net to collect feedback and ideas. It hardly seems to be worthwhile, but I am sure it has possibilities.

Why not give me your opinion on air instead of on paper — Thursday nights, 1130UTC, 3.680MHz ± QRM.

Come up and talk to me sometime.

73 Brenda VK3KT.

Club Corner

Pounding Brass at the Peninsula School Amateur Radio Group Club Station, VK3CPS, is Chris Chapman VK3VCC. Looking on are Anthony Hildebrand and Michael Gong.

PENINSULA SCHOOL ARG

The Peninsula School Amateur Radio Group, under the call sign VK3CPS, was set-up during February 1985. Prior to this time, a number of the students at the school in Mount Eliza, Victoria, had taken part in the Remembrance Day Contest and shown an interest in amateur radio.

During 1984, a small group of boys studied for their Novice licence, and Chris Chapman gained the call sign VK3VCC. The latest student to get his licence is Steven Brough VK3PIQ.

Under the guidance of the Science/Maths teacher, Steve Curtis VK3CAX, the Group hope that 1986 will see the start of regular Morse and theory classes.

The school's parent association provided the funds for the purchase of a second-hand FT-101E and projects underway include putting up a new antenna and the construction of a QRP rig.

AR

DEVIL NEWS FROM THE N W BRANCH

The Branch now has a group of people who are going to gather news and arrange broadcast announcers for when the broadcasts are done on the north west coast. A gathering of these people, together with some from the north and south, will shortly meet with the intention of making our news more interesting.

The final designs for a QSL card for the Branch have been handed in by Max VK7KY. The designs will be discussed at an executive meeting to decide on one design and the printing arrangements.

The secretary of the Branch, Tony, has asked members for their total support with Camp Quality. Camp Quality is a group that has a camp for children with cancer and it is planned that the NW Branch will help with communications, etc.

A local equestrian club has forwarded details of an event, to be held in March at Ulverstone, and they have asked for help with communications for the Jumps Events. There were some volunteers so, John VK7ZPT, the WICEN Officer for the Branch suggested it would be a good WICEN exercise.

Andrew VK7ZAP, the Repeater Officer, has asked operators to use their call signs when using or making tests on the repeater. Funds have been allocated for a new system for VK7NW and VK7RAD is complete and ready to go. The only problem is to get the man- power to install it at the repeater site.

The QSL Bureau had 152 cards inwards and 78 outwards for the month.

Greg VK7ZBT, Activities Officer, has many ideas for activities during 1986, some being Talks, and Videos.

The Clanger Award was presented to John VK7KDR, as while he was speaking on channel 50 he had to QSY to rescue his torch from his dog. We have heard of feeding dogs a light diet, but torch and batteries? ?

A fund-raising committee was selected to think of some money-making ideas. Those involved are: VK7s ZAP; ZPT and WP.

Greg VK7ZBT, has presented the Branch with a large sign for use when members are doing some community work so that it may be known who the group are. The sign is made up of the WIA logo, and the North West Branch, Tasmanian Division of the WIA printed boldly on it. This sign has been well received by the members and is considered much needed.

At the close of the meeting, Syd VK7SF showed some videos of his last overseas trip which included scenes of Cardiff.

Contributed by Max Hardstaff VK7KY

AR

THE GLADESVILLE DISTRICT EXPERIMENTAL RADIO CLUB —

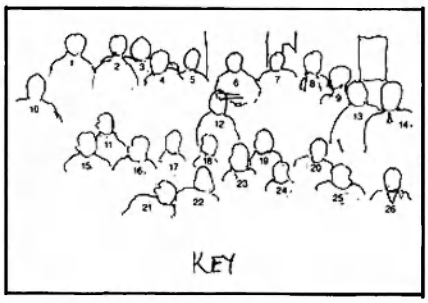
VK2ADY 1935 — 1955

Ken Andrews VK2ATK
32 Aeolus Avenue, Ryde, NSW. 2112

The Gladesville District Experimental Radio Club (GDERC) came into existence in 1935, largely as a result of the enthusiasm of the *Founding Fathers*, Charlie Fryar VK2NP and Wal Webster VK2EW. It thrived until the outbreak of World War II, when, in common with all amateur radio activity, it went into forced recess *for the duration;* members packed up their amateur radio gear in the then ubiquitous *butter box*, and took it to the Radio Inspectors' Store in the then Grace Building, at King and York Streets in Sydney.

After the war, with many prospective amateurs fresh from radio training in the services, the club recommenced operation under the guiding hands of Charlie and Wal, once again.

By the late 1940s, it could fairly claim to be a force in the local amateur radio scene, with well-



Members in the photograph are: 1 ? ?; 2 Alan Llewellyn VK2AH; 3 Ken Whitmore VK2AKK; Jim Rudder VK2AJR — now VK2DCF; Lyle Patison VK2ALU; Ray Hancock VK2YM; Dave Andrews VK2AWZ; 8 ? ?; 9 Jack Wilson VK2XK; 10 ? ?; 11 Merv Smith VK2ZD; 12 Mac Brown VK2AQB (SK); 13 Ken Andrew VK2ATK; 14 Keith Alcock VK2AOA — now a VK3; 15 Ez Griffith; 16 Allan Tollow VK2AST (SK); 17 Bill Bardin VK2ABZ (SK); 18 Lionel Todd VK2LS (SK); 19 Bill Turnbull VK2AQQ; 20 ? ?; 21 Graham Allen; 22 Wal Webster VK2EW; 23 John Miller VK2ANF (SK); 24 Charlie Fryar VK2NP (SK); 25 ? ? and 26 ? ?.

Some members of the club, not included in the photograph — Peter Alexander VK2PA; Bob Beveridge VK2IT — now VK2JZ; Bob Black VK2QZ; Mick Carruthers VK2AQF; Henry Deschamps; Dick Ellis VK2AHR (SK); Norm Franks; Bruce Glassop VK2BG (SK); Norm Hannaford VK2ZB; Horrie Lapthorne VK2HL (SK); Gordon Lee VK2AFL (SK); Arthur Littleiohn VK2AL; Roger Lloyd VK2AMO; Bill Manley VK2MW; Les Reddacliff VK2AEX; John Rottenbury VK2ANX; Paul Sullivan (SK); Cec Thornthwaite VK2AZO (SK) and John Thornthwaite VK2ATO.

attended weekly meetings, complete with guest speakers, construction sessions, fox hunts, field days, etc. A 40 metre transmitter and receiver was constructed and housed in the Club Rooms (a converted stable/garage), at the rear of a residence on the corner of Sunnyside Street, and Victoria Road, Gladesville, and operated by club members under the then club call sign of VK2ADY.

"166 mc/s" (sorry MHz) was the immediate post-war "2 metre" allocation, and the club took a special interest in developing this band. Modulated oscillator/super regen was the 'state-of-the-art' technology, and beautifully home-constructed gear was produced and displayed by such master-craftsmen as Charlie Fryar VK2NP, Horrie Lopthorne VK2HL, John Miller VK2AMF, and Allan Tollow VK2AST, and proved at many field days, with portable stations out on high ground, such as Leppington or Kurrajong Heights, striving to work back into Sydney. (This was hot-stuff in those days!).

All gear was, of course, converted *disposals* or *home-brew*. It also used valves (remember the 954 acorn series, and 7193s and RK34s with both plate and grid caps?) which made for power-hungary gear. Portable petrol driven alternators were about 30 years *down-the-track*, so the gear was generally powered by ex-disposals generators driven by the biggest accumulators one could *scrounge*.

The club also took a keen interest in 40 metre Fox Hunts, and weird and wonderful were the portable creations of those days.

The accompanying photograph shows members present at a meeting in 1949, but listed separately are many others who were either then, or at other times, also members of the club.

Sadly, as the younger members married, built homes, raised families, or moved away, the club went into a decline, and finally went into permanent recess in the mid-1950s.

The list of members contains names and call signs which, I am sure, will awaken memories in our older brethren. While a number are now Silent Keys, some have moved away, including interstate; others allowed their call signs to lapse, and with later re- awakened interest, had to take out new call signs.

Many, however, are still active on the New South Wales scene, one of the most notable being Wal Webster VK2EW, one of the original founders of the club, and now aged 74.

Wal Webster VK2EW.

Wal was a former PMG telegraphist, and while he does use phone, has a particular interest in CW, using his trusty Vibroplex, a carry over from his professional days, and in AMTOR and RTTY using a Commodore 64 and a converted television for a monitor.

I guess there are always exciting developments going on in amateur radio, but it was especially good to belong to the GDERC in those immediate post-WWII days!

Since the club ceased operation in the mid-1950s, a new club formed in the district during the mid-1970s, known as the Gladesville Amateur Radio Club. This small group conducts several local repeaters, amateur television transmissions and a series of classes on many amateur radio subjects.

Hopefully this new group will be able to write-up their history for inclusion in a future issue of Amateur Radio.

AR

INAUGURAL MEETING

This photograph depicts some of the faces seen at the inaugural meeting of the South-West Zone of the WIA NSW Division, which was held on 5th July 1953.

At the meeting, the chairman was the late Jim Corbin VK2YC, the then President of the VK2 Division. Members came from Wagga, Tumut, Griffith, Albury, Narrandera, and Coolamon.

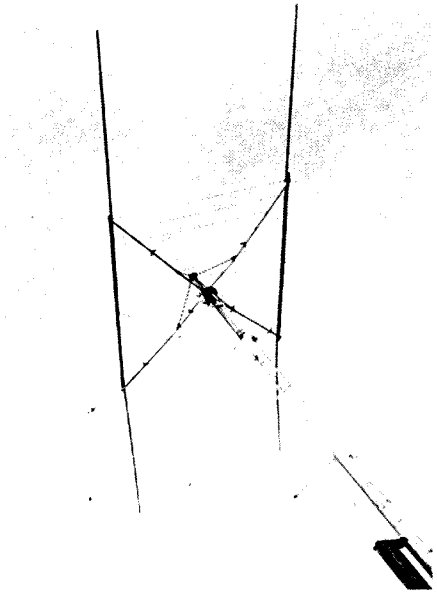
From this initial meeting evolved the Annual South-West Zone Convention, which was first held at Lake Albert, Wagga Wagga, in October 1953.

REAR (l to r): Unknown; Don Haberect VK2RS; Unknown; Lyn Furner VK2AQE/2ANI; Stan Mitchell VK2AID (SK); Unknown; Brian Jones; Ted Bruitt VK2AXD.

FRONT (l to r): Ross Weeden VK2PN; Arthur Phipps VK2EU (SK); Geoff Page VK2BQ; Jim Edge VK2AJO; Bruce Fleck; Jim Corbin VK2YC (SK); Stuart Savage VK2PL/2BHR

The photograph was taken by Alf Moye VK2BW (SK) and contributed to Amateur Radio by Jim Edge VK2AJO.

CLOTHESLINE AERIAL



The accompanying photograph is a mini-20 metre, two element Yagi, referred to by the owner as the "Clothesline Antenna". The frame-work is actually a salvaged 'rotary clothes hoist' on a manual rotating tower, and it works extremely well — just listen for Ron VK3MB, from Harkaway, Victoria, for the proof.

SMALL PORTABLE SATELLITE TERMINAL

A portable satellite terminal which can transmit and receive written text just about anywhere in the world has been designed to fit into a single briefcase.

Existing terminals needed to be packed into two large suitcases.

The designer, 30 year old Norwegian, Hans Christian Haugli said it would work anywhere provided there was an unimpeded view to a satellite. Either in the open or through a window.

Haugli developed the system with a team of fellow engineers at the London headquarters of the International Maritime Satellite Organisation, INMARSAT. It will cost about $7 380 in its present form.

The system consists of a box the size if a large detergent pack with an omni-directional antenna bulging out of a plastic bubble at one end. It connects to a small battery pack and a mini computer keyboard with a weight including batteries of 11.5kg.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

SPECIAL NOTICE

ATTENTION - VK2 DIVISION MEMBERS

The 1985-86 Annual General Meeting of the New South Wales Division will be held in the Auditorium of the Granville RSL, at 2pm on Saturday, 5th April 1986.

Nominations for the Council and Agenda Items for inclusion in the business paper must be received by 2pm on Wednesday, 5th March 1966, at the registered office of the Division — 1st Floor, 109 Wigram Street, Parramatta. (By post to PO Box 1066, Parramatta, NSW. 2150).

Nomination forms are available from the Office.

A separate posting of the Annual Report and Financial Statement, together with any other matter for the AGM will be sent to members during this month, March 1986.

Signed: Jeff Pages
Secretary

I had planned to make this issue another VK2 Special. However, as the deadline approached I was still awaiting some of the promised material.

One item which did arrive was an historical look at the old Gladesville District Experimental Radio Club, written by Ken VK2ATK, an early member of that club.

It would be nice to cover each club, past and present, in a small article, so club secretaries be on the look-out for a letter from me in the near future. The subject has been brought to the clubs before in the affiliated club posting, but this method of inquiry rarely produces a reply. Another item we would like for display at the Parramatta Office from those who have them, is a *sample* copy of any awards your club or group may produce.

GROUP CLASSES

This is the time of the year when many groups start their various classes. Many inquiries are received about classes, both in the city and the country. Has your club upgraded the records in the office about classes and who to contact about them, as well as general club matters? Call (02) 689 2417 or write to the office to up-date the reference material— please! !

JOINING FEE DELETED

At the January Council meeting, it was decided to abolish the joining fee from the Division membership fees, to be effective from 1st January 1986. The fee for this year, which has remained unchanged for several years, is — Full Member $31.50 and Associate Member $29.50.

FEED-BACK REQUIRED

As previously mentioned, a 23cm beacon has been installed at Dural on 1296.420MHz. The next band to be established will be 10GHz. Some feed-back is required as to which portion of the band is most suitable for a beacon signal. If you can help, please contact the Beacon Officer, John VK2EGI, via the Divisional Office.

COME-ALONG FOR A FUN TIME

A reminder that a barbeque is held at VK2WI, Dural, on the first Sunday of the month, following the Sunday Morning Broadcast. Bring your own food, we provide the fire.

Come-along on 2nd March; 6th April; 4th May and 1st June.

THE END OF A YEAR

This month is recognised by the VK2 Division as the conclusion of the 75th Anniversary Celebrations.

This will be marked by the Seminar, to be held on Saturday, 8th March, at Amateur Radio House, 109 Wigram Street, Parramatta, with a 10am starting time. Included in the program will be the closing of the *Time Capsule*. Bring your QSL card along for inclusion. If you cannot attend, post a QSL in to the Office so that it arrives prior to Friday, 7th March.

The winners of the *Home-brew Contest* will be announced during the day.

COMING EVENTS

Easter — The Urunga Weekend
Saturday, 5th April — AGM (See notice)
Saturday/Sunday, 19th/20th April — Conference of Clubs, which will be hosted by the Orange Amateur Radio Club at Amateur Radio House.

ARE YOU VHF DX INCLINED?

Those who like maps, particularly to locate some high ground to work that DX path, often turn to the survey maps for guidance. Have you seen the series of three dimensional ones in the various map shops?

The Australian series are distributed by Geo-Maps Company of Sydney, and Include, In the range, one on Sydney and surrounding districts; the Snowy Mountains; Canberra; New South Wales; Tasmania and several sizes of Australia.

They are well worth looking at and they do make an ideal present from the family when you (or they) cannot think of a (useful) thing for you, the amateur.

WICEN NOTES

The annual co-ordinators conference will be held on Sunday, 2nd March, in Sydney. WICEN subscriptions for 1986 will be $5.00 and the WICEN Net is held on VK2RWS 7150 and 80 metres, 3.600MHz, at 8.30pm on Thursdays.

URUNGA-AT-EASTER

The annual Field Day-Convention weekend will be held over the Easter period at the New South Wales mid-north coast town of Urunga.

Many of the events this year have been designed without the need to use your car.

A program and other details may be obtained from the organiser — Max Francis VK2BMK, 23 William Street, Bellingen, NSW. 2454.

Further details will be given on the Divisional Broadcasts, 11am and 7.30pm, Sundays.

THE CHANGING FACE OF ATCHISON STREET

It is approaching four years since the move to Parramatta. Number 14 has been demolished and in its place is a three story office block which is occupied by the Friends Provident Life Office (NSW Branch).

Next door, on the railway station side, the adjoining four properties have also been replaced by a low-rise office building. Further up the street, the last old property is currently being demolished.

In the block behind Atchison Street, more than one-third is currently being re-developed.

The Division occupied Number 14 from 1960 to 1982. It was known as the Wireless Institute Centre, or WIC.

One of the reasons advanced by those promoting the move from Atchison Street was to obtain a location which was close to the geographical centre of Sydney, hence equally accessible to all. If you are yet to visit Amateur Radio House, or have not been for a while, why not come out to the Seminar on 8th March?

AR

WA Bulletin

NOTICE OF AGM

Notice is hereby given that the AGM of the West Australian Division of the Wireless Institute of Australia will be held on Tuesday, 22nd April 1986, at the Institute of Engineers, 712 Murray Street, West Perth, at the conclusion of the General Meeting.

Business to be transacted will be:

Consideration of Council's Annual Report
Election of Office Bearers, vis: President; Vice-President and seven other councillors
Election of two auditors
Appointment of a patron
General business which has been duly notified

Agenda items will be advised on the Divisional News Broadcast on the three Sundays prior to the AGM.

Members unable to attend may appoint a proxy in writing in the following form:

I, ... being a member of the Institute hereby appoint ..... also a member of the Institute to act for me as my proxy and in my name to do all things which I myself being present could do at the AGM of the Division to be held at the Institute of Engineers, West Perth on Tuesday, 22nd April 1986.

Signature.....
Witness.....
Date.....

Nominations for council must be tendered in writing to the Secretary, signed by two members and the nominated members acceptance 42 days prior to the AGM.

General Business Agenda Items must be tendered in writing to the Secretary, signed by three members, 42 days prior to the AGM.

Fred Parsonage
Honorary Secretary

AR

SOUTH PACIFIC TELEVISION SERVICE CONSIDERED

The Australian Broadcasting Corporation has been asked by the Department of Communications to look at the feasibility of a television service to cover the south Pacific area.

Such a service, using AUSSAT, would cost about $25 million a year and reach 5.5 million people in Papua New Guinea, Fiji, Kiribati, Tuvalu, New Caledonia, West Somoa, the Cook Islands, Tonga, Vanuatu and the Solomon Islands.

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

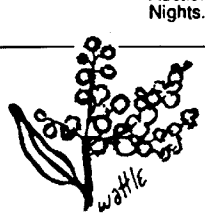
One of the most pleasant ideas to emerge during the WIA's 75th year, which, let's face it, was full of many pleasant things, was the striking of medallions which were to be given to those people who had given special service to the WIA in 1985.

In this Division, we send Christmas cards to the 60, or so, volunteers who give their time and energy each year in some way or another, to the WIA. They may be a Divisional Officer, a member of the Morse Practice Panel, or one of the many Sunday Morning Relay Stations, or, perhaps, they just help at meetings, or cater at Christmas socials and conventions. Whatever they do, their only reward is their own satisfaction and the Council's thanks in the form of a Christmas card. With the Christmas cards everyone (hopefully!) receives one if they have done something for the Division during the year. With the medallions it was different. Each Divisional President, Federal Councillor and Federal Officer was sent one from the Federal Executive. We were then told that the Divisional Council could nominate "about 20" deserving members of our Divisions.

What a headache! Whom to chose and who to leave out? After much "soul-searching" and even some heated discussion, the following members were decided upon.

Sam Nicholls VK5TZ	Broadcast Roster Officer/ Two metre Relay Operator.
Lindsay Collins VK5GZ	Building Supervisor/ Intruder Watch Co-ordinator.
John Butler VK5NX	Journal Technical Editor/ Collation/Transmitter Technician.
Bill Wardrop VK5AWM	Journal Editor/WICEN Supervisor (now Director).
Ron Vernon VK5AAC	Morse Practice Group Co-ordinator/80 metre Relay Operator.
John Mitchell VK5JM	WICEN Director/ Auctioneer at Buy and Sell Nights.
Merv Millar VK5MX	Maintainor of VK5WI 10 metre Beacon/160 metre Relay.
Peter Barlow VK5NPC	Broadcast Producer.
Chris Whitehorn VK5PN	Past Broadcast Producer — now Assisting/also Two metre Relay Operator.
Henry Andersson VK8HA	President Darwin Club/ Relay Operator/Intruder Watch.
Mariana Austin VK5QO	Written History of VK5 Division from 1919-1980.
Joy Charles VK5YJ	WICEN Roster Co-ordinator/Supervisor/ Yachting Trails Co-ordinator.
Graham Horlin-Smith VK5AQZ	Jubilee 150 Activities Co-ordinator.
Bob Allen VK5BJA	J 150 and other PR Functions Technical Advisor.
Jack Coulter VK5JK	Divisional Historian.
Jack Wright VK5FV	Assistance at many PR Functions.
Jill Wardrop	Supper Organiser at Meetings.
Ray Dobson VK5DI	Past QSL Bureau Manager/Assistant with J 150 Cards.
David Clegg VK5AMK	Equipment Supplies Committee/DOC Liaison/ Past Federal Councillor.
Don McDonald VK5ADD	Minutes Secretary/ Commissioner for Scout Radio (JOTA).
John Gardiner VK5PJQ	Education Officer/ Publications Officer.
Ken Westerman VK5AGW	Membership Secretary.
Jenny Warrington VK5ANW	Secretary/Vice President/ Columnist.

AR



Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT. 2606

MARCH GENERAL MEETING

The March General Meeting will be held on Monday, 24th March, beginning at 8.00pm, with doors open at 7.30, in the Griffin Centre, Civic. The topic will be batteries, and their use in amateur radio. The Book-Stall and QSL Bureau will be available, as usual.

MEMBERSHIP FEES

A quick update on the VK1 membership fees. The range of fees for VK1 members are:

Full/Associate	*$34.00*
Family	*$22.00*
Student	*$22.00*
Pensioner	*$24.50*

NOTE: It is necessary to produce a Pensioner Health Benefits Card for Pensioner concession.

VK1 AWARD RECIPIENTS

Phil VK1PJ, the VK1 Awards Manager, advises the following awards have been issued since the last publication. VK2CZX and ZL1AQO received Gold Upgrades; VK1BAT received a Silver Upgrade; and JA4JBZ and L70227 received the Basic Award.

Congratulations to all those listed for their achievement.

JOHN MOYLE FIELD DAY

As previously mentioned in these columns, the VK1 Division will be running a station in the John Moyle Memorial Field Day Contest. The details are as follows:

Date — 15 and 16th March; Call Sign — VK1WI; Location — Bulls Head in the Brindabella Ranges; Frequencies will be 160 metres through to 23cm.

The site to be used is west of Canberra, at Bulls Head, in the mountains. The site is at an elevation of 1366 metres and is an excellent VHF/UHF location with AGM grid co-ordinates of 35 degrees 23 minutes 13.763 seconds south; 148 degrees 48 minutes 44.186 seconds east — it is at Zone 55, Easting 664600, Northing 6082500. We will be monitoring the usual call-channels of 52.100, 144.100, etc, as well as keeping a watch on the beacons.

To all other divisions and clubs, the VK1 Division throws out this challenge — the club which contacts VK1WI on the most number of bands (which must include at least one VHF or UHF channel) will be deemed the *VK1 Favoured Club in 1986.* In the event of a tie, the club whose Field Day station was the furtherest from the VK1WI site will be the winner. The inaugural winner of this most coveted award will receive a handsome certificate attesting this feat, and publication attesting this fact in this column as soon as possible after the contest. I hope to hear and work as many of you as possible on the weekend.

AR

FATHER AND SON BECOME INVOLVED IN AMATEUR RADIO

Ken McLachlan VK3AH
PO Box 39, Mooroolbark, Vic. 3138

Whilst listening to an interview with Jim VK3PC, on a Melbourne broadcast station regarding the hobby for all, amateur radio, a member of the Rotary Club of a suburban area was convinced it would be the subject of an informative speech at one of their meetings.

Jim was approached and agreed to giving a luncheon talk on the hobby which duly took place in mid-1984. At the meeting was Joseph Chan, a local Dental Surgeon.

Joseph became interested and after discussions with his son Joseph (Junior) decided to attend the WIA Courses which commenced in September of that year. In the DOC November examinations both passed the CW and Regulations, Joseph (Junior) was in Year 4 of Primary School at the time,and had just turned 10 years old the month before. No mean effort!

1985 was a year of success. Joseph (Senior) passed the Novice Theory at the February examinations, continued on and passed the LAOCP in the May sittings, finally conquering the CW in November which gave him the call VK3CBQ. Joseph (Junior) passed his theory and obtained his Novice licence in the November sittings.

Both amateurs are interested in electronics and computing, having built their dual disc drive computer from a kit. Joseph, with the call sign VK3PIO to his credit, is now in Year 6 at Primary School, having sat for the AOCP last month and is awaiting the results. All readers wish you luck Joseph in your future studies, the results of the AOCP examinations and your ambition of becoming involved in the electronic technological field after you complete your studies.

Both the amateur enthusiasts are ably supported in their endeavours by the wife and mother of the family, Sandra who describes her husband as 'Mr Fix-it', as he is always tinkering with cars, carpentry or being called upon by friends to fix some of their problems. The other members of this happy family, Francie and Sophie have not yet acquired a taste for the hobby we all enjoy but who knows, within half a decade there might be a five member amateur radio household.

QSP

ELECTROSTATIC ZAP

Static electricity is usually more of a nuisance than a hazard — however hazardous situations can occur. For example, in rising from a vinyl-covered chair when wearing insulated footwear, a person could easily develop a potential of up to 7 000 volts.

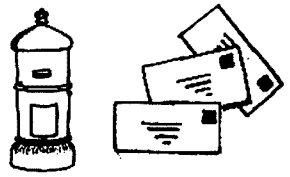
In defence establishments and production factories electrostatic energy is of concern because it can be well in excess of the minimum ignition threshold of many detonators, combustible gases and solvents.

Even lower electrostatic energies can be a problem with computer equipment where data can be corrupted and microcircuits damaged id discharge occurs to some metallic part of the computer.

There were also hazards involved in mail sorting, filling hydrogen weather balloons and in the use of combustible anaesthetic gases in hospitals.

Problems with electrostatic charging can be overcome by taking actions including keeping the relative humidity above 40 percent, and using materials which will dissipate a charge such as wood and metal.

Condensed from "Electrostatics" leaflet produced by the Materials Research Laboratories Physics Division, Electronics Group.



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

TEN METRE FM REPEATER GROUP

A group of Melbourne amateurs have shown interest in establishing a repeater for 10 metres FM. This type of repeater would be the first in the Southern Hemisphere and would have national, and international coverage.

Any amateurs interested in the repeater can contact David VK3UR on (03) 232 5414, or write to Box 32, Clifton Hill, Vic. 3068.

Amateurs can also call in on the 10 metre FM net any Thursday at 0900UTC, on 29.600MHz.

Yours faithfully,

Ian Sinclair VK3DSI,
58 Chute Street,
Mordialloc, Vic. 3195.
AR

THANKS TO EDUCATION

During 1985, I passed the Novice and Full Call examinations and just wish to pass on my appreciation of the assistance given by the WIA. Especially to Brenda VK3KT, the Federal Education Officer of the WIA for her promptness re test tapes, test papers, etc and also her encouragement. A lot of thanks for the NSW CW Sessions, which were great, and I will still make use of them in the future to keep my hand in.

Cheers.

Garnet Freer VK2CQF,
17 Old Bar Road,
Old Bar, NSW. 2430.
AR

CONGRATULATIONS FOR WIA 75 AWARD

May I congratulate those responsible for the creation and dispatching of the WIA 75 Award?

I made many enjoyable QSOs that would not have otherwise eventuated.

On many occasions those who did not need numbers were only too happy to volunteer them.

Despite those who would tell us otherwise, the spirit of amateur radio is very much alive and well, and I feel the WIA 75 Award has ensured that this spirit endures.

I look forward to my next 25 years in amateur radio, when I hope I will have pleasure in gaining the WIA 100 Award.

73.

Con Carlyon VK4BID,
18 Erbacher Street,
Toowoomba, QLD. 4350.
AR

TERMINOLOGICAL ERROR

In reference to Amateur Radio, January 1986, Page 37. Galileo was primarily known as an astronomer and not an astrologer. There is a difference between the two titles.

Keep up the good work. Look forward to future ARs.

Eddie Calleja VK3EE,
26 Donald Street,
Morwell, Vic. 3840.

NOTE: Apologias for the error. However, in Galileo's time the distinction may not have existed. Ed.

AR

THE AMATEUR RADIO MOVEMENT

Your editorial comment in AR, January 1986, is most offensive towards the Amateur Radio Movement!

The association to which all radio amateurs belong, is the international Amateur Radio Movement. A legitimate amateur radio licence is the only cost of membership.

The main aims and spirit of the Amateur Radio Movement are:

1 Freedom of choice (within the licence conditions).

2 Allegiance only to the, non-aligned, licensing authority.

3 No discrimination between amateurs.

The comments in your editorial, and the latest Call Book in regard to WIA membership and the use of open facilities are blatant examples of the world-wide trend by organisations like the WIA to promote discrimination within the ranks of the Amateur Radio Movement, in order that these organisations may gain finance and power with which to *destroy* the original concepts of the Amateur Radio Movement.

Organisations like the WIA, NZART, RSGB, ARRL etc, should understand that they are subservient to the Amateur Radio Movement. These organisations exist only to assist the Amateur Radio Movement. They are not there to encourage division or discrimination by the use of moral pressure.

If a private organisation, like the WIA, decides to provide open facilities, they are doing so with their eyes open! They should not expect, or pressure, non-members to support their projects.

Members to the Amateur Radio Movement should in no way feel obliged to be a member of any organisation. The Amateur Radio Movement is premier: *The only prerequisite is a legitimate amateur radio licence.*

Tony Tregale VK3QQ,
38 Wattle Drive,
Watsonia, Vic. 3087.

NOTE: Since Tony's criticism is aimed at the January editorial, a reply to this letter is made in this issue's Editorial Comment. Ed.

AR

HERMIT HURTLE

As many amateurs know, my husband VK5HW passed away on the 13th December, after a long illness.

Whilst going through some things in his shack I came across a sort of poem which I, and some of his friends believe he wrote himself. I think that through years of frustration of not being able to do as much as he would have liked and having to give up smoking because of his illness, urged him to put some thoughts onto paper.

Yours sincerely,

Jean Watson,
86 Glyde Street,
Albert Park, SA. 5014.

HURTLE THE HERMIT

Old Hurtle Watson's cashed his chips
No more he'll go on hypnotic trips
And no more smoke will pass the lips
Of Hermit Hurtle Watson.

Tobacco killed him or so he'd say
The lack of it, but anyway

The sands of time have slipped away
For Hermit Hurtle Watson.

In his shack on his own
He really never was alone
For there was a microphone
In the shack of Hermit Hurtle.

'Til the day he cashed his chips
The world was at his fingertips
While words drawled slowly from the lips
Of Hermit Hurtle Watson.

Hurtle the Hermit will no more sip
The brew of tea he called Sheep Dip
Nevermore he'll crank the pot
Or stoke the fire to keep it hot
No wonder that the boots did rot
Of that old Hurtle Hermit Clot.

No relatives with reddened eyes
Will weep at Hurtle's sad demise
No lowered flag at half-mast flies
To Honour Hermit Hurtle.

We'll miss perhaps his ugly dial
His raucous voice and drawling style
We'll miss him for a little while
Forget than Hermit Hurtle.

Perhaps somewhere someone will wait
In Europe, Asia or Kuwait
Listening in to hear their mate
Absent Hurtle Watson.

I'd like to think some tears might fall
For Hurtle's ilk no hopers all
Who answer that last trumpet call
Unmourned like Hermit Hurtle.

AR

THE OLDEST

I note that VK3CKC states that the Victorian Railways Institute Wireless Club is Australia's oldest radio club, see AR January 1986, page 14.

I would like to correct that impression. As patron of the Waverley Amateur Radio CLub, I have a copy of the complete DOC file on the licence, VK2BV, ex-A2BV, ex-N249, which states the first licence was issued to the Waverley Club on 18th August 1920. This was pre-dated by the formation of the Club in March 1919.

This has been confirmed by the original sponsor of the licence, Gordon Thomson VK2AVT, who holds AOCP licence number three. The Waverley Club has been continuously licenced for over 65 years, and is the oldest non-WIA radio club in Australia.

Duane Foster VK2VE,
Box 426,
Randwick, NSW. 2031.

Thanks for bringing this to our attention, Duane. (See page 64, AR November 1985 for a brief history of the Waverley Club). Ed.

AR

THANKS FROM THE WAR MEMORIAL

In 1984, the Wireless Institute of Australia launched a nation-wide appeal on behalf of the Australian War Memorial, for military wireless equipment.

The response was overwhelming, and I would like to thank everyone responsible for this success.

One of the items received as a result of the appeal was an AR8Q receiver. The AR8Q receivers were built by AWA during the second world war and were used extensively by the RAAF, the RAN, and the Australian Army.

Our receiver is in exceptionally good condition and it appears it could be made serviceable, given the appropriate power supply unit. I would be grateful therefore if any readers can assist us in this regard.

Thank you once again for the generous co-operation from members.

Yours faithfully,

Mark Clayton,
Curator, Aircraft & Technology for Director,
Australian War Memorial,
Canberra, ACT. 2601.
AR

COPIES OF *FOOD RECIPES!*

I would like to draw attention to an advertisement in the For Sale-NSW Column, page 64 of Amateur Radio January 1986, which advertises the VK Amateur Radio Cook Book.

Myself and another amateur had spotted the advertisement and, as we are both keen home-brewers, and the fact that the advertisement appears in the illustrious WIA Journal, we sent for a couple of copies of this so-called amateur Cook Book. Imagine our disgust and anger when we received copies of *food recipes.*

I do not wish to see the WIA or its Journal become de-graded and most of all, I do not want to

see WIA members cheated or discouraged from home-brewing. I love my hobby and will do my very best to protect it from those who would drag it into the mire.

What hurts more than anything is that an amateur radio operator (for his or her call sign appears in the advertisement and the WIA Call Book) would stoop to such low tactics, I just hope that the WIA and its Journal will do its best to warn members of what to expect from the above-mentioned advertisement, before they find they have no members left to warn.

Yours sincerely,

Glyn Gibbings-Johns VK2DJV,
144 Maitland Street,
Bingarra, NSW, 2404.
AR

DISCUSSION PAPER

I was pleased to see the discussion paper by Jim Linton and Roger Harrison proposing a Digital Class of amateur licence.

If our hobby is to survive, we need the youth of today to be a part of it. With digital techniques such an important part of today's world and every person exposed to the micro-computer, I believe that their quest for knowledge could be enhanced by an involvement in amateur radio.

The secondary school science course of today gives a good basic understanding of electronic and digital principles and some exposure to amateur radio may be seen as an extension of their technical progression.

A digital licence may sound revolutionary, but so did AM and SSB modulation, FM repeaters, satellite communications, RTTY, etc when they were first introduced on the bands. Let's face it, if it was not for SSB, electronic Morse and RTTY, most of us would not even be on the air today.

The doomsday people said the Novice Licence would lead to the worst aspects of CB radio becoming evident on the bands, but instead, most novices are up-grading. Thanks to the Novice Licensees, 10 and 15 metres have seen more activity than in the previous fifty years. As for the reducing of operating standards, I have noticed very little change in the last 25-years.

Amateur radio, which has traditionally been the fore-front of new technology, is being left to flounder as the rest of the world moves into the 21st century. So let us support the proposed licensing update and move amateur radio into the 21st century where it may have some appeal to the youth of today.

Yours faithfully,

Peter O'Keefe VK3YF,
PO Box 654,
Shepparton, Vic. 3630.
AR

HAVE YOU OLD PARTS/

This letter is a request for help in a little project I wish to undertake. I want to build, for my own pleasure, a crystal set. This is easily done these days, the kits are available off the shelf in many places. However, I want to build mine as a home-builder would have done in the days when the "Cat's Whisker" was the way to a new and wonderful form of entertainment. I want to utilise components that might have been available then.

Since this magazine has been around for many years, I hope to tap the expertise and advice and maybe even parts, from some of the "Old Time Members".

I look forward to any response.

Yours faithfully,

Dave Nicholls,
15 Dart Street,
Boulder, WA. 6432.
AR

JOHN CITIZEN IS ALIVE AND WELL

I note from page 23 of January AR, John Citizen has joined the ranks of amateur radio.

With apologies to both John Clarke and his alter ego Fred Dagg, I had expected to hear nothing further of John Citizen since he had his personal affairs revealed to the nation in the Form S Taxation Guide.

We now find John is again in the public eye. As exclusively reported in AR, John Citizen has smashed through all previous known technological barriers to exert his obvious expertise by passing the DOC examinations on 1/4/99, some 12 years hence.

The fact this lad is right up there with the best of them is clearly demonstrated by his passing the NAOCP and LAOCP examinations on the one day. We may quickly gloss over the fact John is 228 years of age at the time.

What I found especially fascinating is John presents himself at DOC examinations flashing blue eyes and sporting pink hair. What is behind this devil-may-care attitude?

It had no effect on the minister's delegate, a Mr Fred Bassett of DOC.

Also, we can note the fact that his stature diminished from 180cm down to 110cm between examinations. This is a bit worrying.

Could it be that his secret process for transferring 228 year olds into the future began to wear off?

Could it indicate an inherent risk for any 228 year old sporting pink hair, who flashes blue eyes at DOC examiners twice in one day, 12 years into the future, will be reduced to instant dwarfdom?

My father VK2ARP, has always warned of the dangers of "fiddling about" with radio. Never has this been more evident.

73,

Ian Purdie
19 Hollis Street,
Wentworthville, NSW. 2145.
AR

AMATEUR RADIO — FUTURE?

Amateur radio evolved from the AOCP only, to include, in 1959, the limited licence and, in 1977, the novice licence. Each has attracted new people who have maintained the traditions of our hobby. Today our growth rate has slowed again to zero. As before, we ask, "What can be done?" Today only one percent of amateurs are under 20 years of age. If we leave things as they are how many amateurs will we have in the future?

It is easy for us to do nothing — after all, we are licenced and how many of us will be alive in five, 10 or even 15 years, anyway? How many of us objected to the recent DOC increase to a $30 examination fee? There is no age limit, but who cares if today's 11 year old has to pay $30 to sit, or more, to re-sit for a hobby licence which traditionally cost $2. US amateur examination fees, by law, cannot exceed a little over $4.

Australia copied and modified the successful ideas of other countries when it introduced the limited and novice licences. Copying ensured that, as in other countries, those licences would attract the right kind of enthusiasts.

Today, you cannot tell a Novice from a Limited, from a Full licensee, we are all radio amateurs.

I am interested in the Discussion Paper, written by Jim VK3PC and Roger VK2ZTB, which was printed in February's Amateur Radio. It suggests a VHF/UHF only beginner's licence, based on the Japanese novice voice licence. The Japanese have successfully attracted large numbers of teenage youngsters to the hobby. All operators in Australia agree, as we hear daily on 21MHz, that these newcomers are as polite and amateur spirited as any in the world. With an examination level equal to the Japanese novice we should be able to copy their successful formula and attract large numbers of youth and still maintain the same unmistakable amateur spirit.

The enhanced, or updated novice idea is similar to that proposed by the ARRL. In the USA, a multiple-choice question paper, consisting of 20 questions, is constructed and administered by an unrelated and non-commercially involved amateur. Such exams can be taken by any newcomer, at any time. This has worked so well that the ARRL has asked FCC to enhance the US novice, which is presently CW-only, to include voice and data modes such as RTTY, Packet, etc to further attract newcomers, particularly the thousands of bright computer kids out there. The novice was great in attracting the CB-radio buffs, now the technical kids are into computers. An updated novice licence will have the relevance needed to attract these kids.

It is clear that both the Japanese and American novice levels, though easier to obtain, are in no way detrimental to the hobby. If adopted, they could boost our numbers and make it easier to attract even more newcomers.

Scrap the present exam system conducted by DOC and replace it with the successful US or Japanese one.

For example:

VHF/UHF only Beginners Licence (Equivalent to the Japanese Novice Voice Licence). The examination method and level would be identical to that in Japan; ie conducted by endorsed volunteer examiners or in schools following an amateur radio course.

Enhanced Novice Licence. This examination would be conducted as is the US Novice test; ie by any qualified amateur licensee above the novice level with safeguards as in current US regulations.

Additionally, several long-standing items enhancing our service should be included in overall discussion with DOC.

They could be:

Repeater Linking — this is within amateur bands and should be an amateur affair. For DOC to take years to cross and dot every experiment and development within our hobby should not be necessary.

AOCP Power Level — USA novice licensees are newcomers lower in examination level than our own novices, yet are permitted 200 watts CW output. This is more than the 120 watts CW maximum for our top class AOCP licensees. In May 1985, Israeli top amateur licensees power was raised to 1 500 watts PEP output. US amateurs achieved this same power increase even earlier.

Remote Control Linking — any US amateur can remote-control his HF station via UHF links and in this way can talk world-wide from his hand-held, or car. The requirements to file details on such amateur radio remote control links, including the safeguards, are part of US regulations and should be easily adopted here.

Packet Radio Digipeating and Unattended Operation in General by Individual Amateurs — we should consider adopting US amateur radio regulations straight out for the same reasons we adopted the US Third Party Traffic Regulations in total. Using the VI call sign over the last few months of 1985 was great, and with the above suggestions it should ensure that there will be plenty of interesting things to talk about in 1986.

Sam Voron VK2BVS,
2 Griffith Avenue,
Roseville, NSW. 2069.
AR

CONGRATULATIONS

May I congratulate the Editor of Amateur Radio on his powerful and timely Editorial in January's AR.

Dave Richards VK4UG,
12A Savannah Street,
Redcliffe, Qld. 4020.

QSP

EVERYBODY HAS HEARD OF EMI, BUT WHO HAS HEARD OF SMI?

The following item appeared in the September 1985 issue of the South African Shortwave Listener, and later in the November 1985 issue of DX Post.

A new problem has shown up on the amateur bands. It is SMI. During a QSO Don Grant KR6J was having with Glen Turner NF7T, in Seattle, Washington, he received a call to the phone. His neighbour, knowing (or at least thinking she was alone in her home, as her husband was working out of town) heard a man's voice coming out of her Electronic Sewing Machine.

Glen said the lady said it was a little scary until she figured out whose voice it was. Glen was coming in loud and clear, she said, but not to worry. With his beam pointing right over her house to talk to southern California, she had a treat to listen to a QSO while she did her sewing! How nice some neighbours can be!

Silent Keys

It is with deep regret we record the passing of —

MR MALCOLM BROWN VK2AQB
28th December 1985
MR FRANK CARROLL L30338
REV H ELLSON VK3DRO
19th December 1985
MR JOHN HAY VK2DTF
1st November 1985
MR E W JINKS VK2ADJ
MR R J MARRIOTT VK3SI
12th November 1985
MR P A MCARTHUR VK2DCS
20th August 1985
MR J P ROSEWARNE VK5MN
27th July 1985
MR E M SIMPSON VK2ES
21st June 1985
MR GEORGE TURNER VK3GN
MR I M UPSON VK7NMU

Obituaries

TOM MANKS VK3TZ

It is sad to report the passing of Tom on 29th December 1985. Tom was the victim of a fatal heart attack.

Tom was first licenced in 1935, and had just completed 50 years as a radio amateur. During his early days in radio he operated on 80 and 40 metres, but recently had moved on to 20 metres. After licences were re-issued in 1946, he also operated on the temporary 166MHz band.

He was a Pharmaceutical Chemist by profession, but had recently retired.

To his wife Grace, sons Gordon, David, and Robert and their families we extend our deepest sympathy.

Ron Bell VK3MB
AR

EDWIN WILLIAM JINKS VK2ADJ

It is with deep regret I advise the passing of Eddie Jinks VK2ADJ, ex 2HX. Eddie was born in Broken Hill and gained his amateur licence in the early 1930s. He was one of the "Old Timers" who used to broadcast music for the locals when it was permissible to do so.

Eddie was last employed as a Communications Officer with the Department of Civil Aviation, and spent many years with that service in the north of South Australia. During the war he served as a War Correspondent with the ABC.

He was a member of the Broken Hill Blind Association.

Eddie was still interested in radio and was a White Stick operator until a few months before his passing.

He leaves a widow, Phil and four sons to whom we extend our deepest sympathy.

Charles Dennis VK2AXL.
AR

HORRACE OAKES VK2FA

It is with deep regret that I advise of the passing of Horrace Oakes VK2FA on the 5th January, 1986 at Wyong Hospital after a short illness.

Horrie was just one week short of his 87th birthday.

He was born at Bolton, Lancashire, England on 12th January, 1900. He served an electrical apprenticeship in England and came to Sydney to reside in 1918. He started a radio business in High Street, St Kilda, Victoria (about 1940) and still later in 1944 he opened a radio business in Oxford Street, Woollahra, having an agency for Swan and Hallcrafter Amateur Radio Equipment. The shop was a "mecca" for many radio amateurs. He was first licenced in 1952 as VK2FA.

Horrie served for a time on the NSW Division, TVI Committee and was also keen on antenna design. Retiring in 1971 he moved to Berkeley Vale on the central coast and soon had an excellent antenna system on HF, VHF and UHF.

Horrie had many friends world-wide and I consider myself fortunate to be among them.

We had a daily sched on 7MHz and 21MHz and latterly on UHF for over 19 years. He will be greatly missed by all his friends and listeners.

Gordon Thomson VK2AVT.
AR

GEORGE TURNER VK3GN

It is sad to report the sudden passing of George on 16th October 1985, whilst he was visiting Swan Hill.

George, who was in his 72nd year, became interested in radio, as he said, one magic day in 1924 at Myrtleford, through his brother Charles VK3AOI, listening to amateur stations on a one valve set.

In 1927, he became an Assistant Projectionist, embracing the surrounding country areas. Eventually, he joined his parents in Maryborough and was attached to the Paramount Theatre. He attended the technical school for his Projectionist Licence.

He became firm friends with John O'Hare VK3BO (later 3OH), and was his second operator on the 200 metre band. Clive Holland and George decided to sit for their amateur licences in early 1937. Both passed — Clive became VK3XC.

In 1938, George was appointed projectionist at the new Midland Theatre, in Ararat. He stayed at my home until he had settled into the area.

A highlight of the 1940s was his participation in the Third Post War Western Zone Convention, when with others, he helped set- up radio communication for the Westmere Rural Fire Brigade, the first network of its kind in Australia. Sets used were FS6 and 108 transceivers, working approximately 96km (60 miles). Present were VK3AMP, VK3NW and VK3MJ and at the dinner, visitors from the Country Fire Brigade.

George helped Kevin Duff VK3VC obtain his amateur licence.

A highlight for George was the three-and-a-half months he spent in the USA in 1970, during which he met many amateurs.

He retired from the movie business five years ago and thanked his lucky stars that he was an amateur. Privately, he was still interested in re-building old projectors, which he had at home.

It is noticed that two Old Timers who held the VK3GN call sign passed away suddenly within a short time of one another. (George Selman VK3CM, ex 3GN passed away on 18th September).

To George's widow Ada, and his family we extend our deepest sympathy.

Charles Nelson VK3WC
AR

PARLIAMENT HOUSE WIRED

About 80km of coaxial cable, with nearly 1 700 outlets will be installed in the new Parliament House, now under construction in Canberra.

Philips Australia has won the $1 million contract to cable the building which will be home to both chambers of Federal Parliament from 1988.

The building, designed to last 300 years, will incorporate the world's most extensive in-house communications system.

SEWING CIRCLE STORY

Bob Jackson VK7NBF
Falmouth House, Falmouth, Tas. 7215

The Tasmanian Sewing Circle is not what it seems. For one thing there is not a needle or reel of thread in sight. But, there are Morse keys, valves and aerials aplenty.

This name is a long-standing 'nickname' for a group of about 50 dedicated amateur radio enthusiasts, mostly retired men, who get-together each evening for a chat over the air-waves. They come from all over Tasmania and their conversation covers almost every subject imaginable.

The Circle began in 1962, when the late Jack Batchler VK7JB, and his friend Snowy Harrisson VK7CH, maritime mobile on the MOORINA, had daily conversations on 80 metres. The mode used was CW, (it had to be as Snowy swears that he does not own a microphone, even to this day). Jack used an Army 122 set.

They were soon joined by the late Bob O'May VK7OM and others, but the mode changed to SSB when Snowy was not on the net. They earned their nickname one evening when the session delayed the Batchler's mealtime. Jack's wife, Joy VK7YL, said that the men reminded her of a sewing circle at school — a select group of students who were allowed to talk as they sewed. Jack protested that it was a strange comparison for a bank manager, a marine engineer and an Army officer. However, despite his protests, the name stuck and is still in use to this day.

In 1981, Joe Brown VK7BJ, presented a framed photograph of a sewing machine which was to be awarded annually to the most loquacious member of the group. For the past three years, a barbeque has been held at the home of Bill VK7NRV, where the presentation is made. The winner is the sole judge of the recipient for the next year. The current holder is Owen VK7OL.

Reference material The Southern Star
AR

QSP

WE NEVER HAD IT SO GOOD!

"We understand that Mr Garner-Jones, Headmaster of the Levuka Public School, has been permitted to erect a wireless station at Levuka for the benefit of his pupils.

"We are quite in sympathy with this concession and we must congratulate Levuka's progressive headmaster on the achievement, but we cannot quite understand the attitude of the Government in refusing licences to those who are desirous of experimenting in the same line.

"It is reported from Lautoka that for erecting a wireless receiver a resident there has been fined four pounds".

So said the *'Fiji Times'* on 19th September 1911.

Harry Cox VK4OX, was reading through the *'Fiji Times Centennial Supplement, 4th September 1969'* recently and came across the preceding article. Harry comment is *"The written word should make all amateurs of all categories be truly thankful to the WIA and pioneers for what we have today!"*

It may be of interest to cricket-loving amateurs, from the same paper, Ratu Kadavu Levu and his Bau eleven were invited, by the Melbourne Cricket Club, to play a series of cricket matches in Victoria. Kadavu was confident of victory against all-comers. This article was dated 29th June 1907.

THOUGHT FOR THE MONTH . . .

Minds are like parachutes — they only function when open.

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The New ATC-720X provides inexpensive airband communications for a wide range of applications. Its most important includes promoting the peace of mind which comes from knowing you have an emergency back-up transceiver with you. It is supplied complete with rubber antenna, alkaline batteries and carrying strap. **$749** · S.T. · **$14** P&P **$959** Inc S.T.

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8D-FB	1.20	1.74	2.58	3.90
10D-FB	0.99	1.44	2.10	3.30
12D-FB	0.84	1.23	1.80	2.79
RG-8/U	1.95	N/A	N/A	7.44
RG-213	1.74	N/A	N/A	7.20

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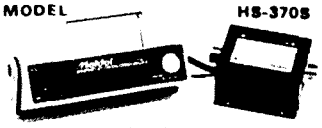
MODEL HS-370S



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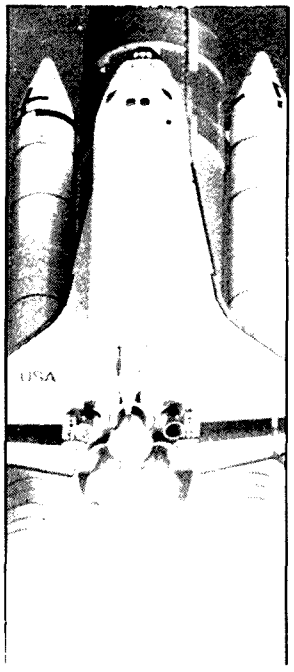

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$399 + $14 P & P

ANTENNA MATCHER FOR CONTINUOUS HF COVERAGE - MFJ-941D

Apart from being extremely versatile the MFJ-941B includes a 6-position coax-switch, SWR power meter, 4:1 Balun and will feed balanced line, single wire and coaxfeed antennas.

$334 + $14 P&P

2 KW DUMMY LOAD

MFJ-250 Low SWR to 400 MHz, 2 KW PEP, supplied with transformer oil.

$89 + $14 P & P

EXPANDED RANGE OF HF VHF UHF ANTENNAS

BROADBAND ANTENNAS

LOG SP — 85 to 520 MHz

$199 + $14 p&p

LOG S 100 to 520 MHz

$139 + $14 p&p

HF BROADBAND DIPOLES

New T2-FD series provides continuous HF coverage

200 WATT MODELS

3.5-30-T2-FD-200 is 25m long 3.5-30 MHz

1.8-30-T2-FD-200 is 30m long 1.8-30 MHz **both priced at $171 + $14 p & p**

2KW MODELS

3.5-30-T2-FD-2KW is 40m long 3.5-30 MHz

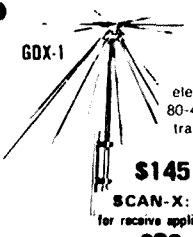
1.8-30-T2-FD-2KW is 50m long 1.8-30 MHz **both priced at $228 + $14 p & p**

RF NOISE BRIDGE WITH BUILT IN EXPANDER

MFJ-202B

These individually calibrated noise bridges read both inductive & capacitive reactance over a much wider range than the others. Simple to use and covers 1 to 100 MHz **$193 · $14 P&P**

BROADBAND OMNIDIRECTIONAL ANTENNAS FOR SCANNERS



GDX-1 16 element discone 80-480 MHz suits transmitters and receivers.

$145 + $14 p&p

SCAN-X: 8 element discone for receive applications 66-520 MHz

$92 + $14 p&p

2 metre RINGO

The antenna for 2 mx FM work. 9dBi gain, omnidirectional.

$94 + $14 P&P

GIVE YOUR RINGO ANOTHER 1.5dB

with our RK-1 decoupling radial kit

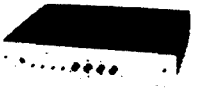
$23 + P&P

FOR THE RTTY OPERATOR

MDK-17 (KIT) MOD-DEMOD

A high performance RTTY/CW modem kit for use on a computer or teletype. Offers high noise immunity on receive. **$142 + $8 p&p (kit) or $219 $8 p&p (assembled).**

MFJ-1224



Versatile RTTY/CW modem interfaces with a computer and is supplied with software for VIC-20 or Commodore-64 **$345 + $14 p&p**

Great Circle Map

Now point your beam in the correct direction using this Great circle Map centred on Melbourne **$2** + $3 P&P

What is stronger than wire of equivalent cross section, non corrosive, non conductive, and has virtually no elongation?

NEW DEBEGLASS WIRE

Now, guy your tower without having to break the wires with dozens of egg insulators, or worrying about them corroding away due to a salty atmosphere. Our Debeglass wire alternative is made using continuous filament fibreglass yarn, jacketed in UV stabilized vinyl chloride. Compare the figures below.

	DB-4 (4mm)			DB-5 (5mm)		
	Conductance (mho)	Wt of 200mm (gm)	Tensile Str (kg)	Conductance (mho)	Wt of 200mm (gms)	Tensile Str (kg)
Debeglass	2.5	3.9	450	3.0	6.5	680
Steel wire	2.5	5.6	370	3.0	9.1	580

DB-4 (4 mm) $0.55m DB-5 (5 mm) $0.78 DB-6 (6 mm) $1.30 Debeclip Termination Clip to Suit DB4, DB5, DB6 $4.95 each Debelock Termination to suit DB4, DB5, DB6, $1.50 each

electronic imports

AUSTRALIAN DISTRIBUTOR

GFS ELECTRONIC IMPORTS

Division of Deribar Pty. Ltd.

17 McKeon Road, Mitcham, Vic. 3132
PO Box 97, Mitcham, Vic. 3132
Telex: AA 38053 GFS
Phone: (03) 873 3777 3 Lines

AR86

SOLAR GEOPHYSICAL SUMMARY

OCTOBER 1985

Solar activity was low throughout the month with the exception of 26th October, when there was a single M1.8 solar flare. Prior to 15th October, the sun was mostly without spots and the 10cm flux was at low levels. After 15th, two regions began to grow rapidly and the flux rose rapidly to a peak of 95 on 22nd and 23rd. The growth of these regions culminated in the flare on 26th. Both regions were decaying rapidly as they rotated over the west limb on 28th.

10cm flux readings were: 1,2=67, 3=69, 4=68, 5=67, 6-9=66, 10=67, 11=68, 12,13=67, 14=70, 15=72, 16=74, 17,18=76, 19=78, 20=80, 21=86, 22,23=95, 24=94, 25=92, 26=85, 27=80, 28=78, 29=75, 30=72, 31=71. Average was 74.8. Sunspot average was 18.5. Running yearly sunspot average was 17.8 for 4/85.

GEOMAGNETIC

4-8 October. . .The geomagnetic field became disturbed after 1900 UTC on 4th and reached storm levels early on the 5th and remained at storm levels until the end of the 6th. It was generally active on 7th and 8th. A=15,42,33,21.

11 October. . .The field was at active levels A=17.

13 October. ...The field was at active levels A=16.

15-18 October. . .The field was at active levels with the most disturbed periods being 0200-0900 UTC on 15th and 0000-1300 UTC on 16th A=20, 16, 17, 18.

22 October. . .Field at active levels A=10.

The quietest days were 1=2, 26,27=3, 28,30,31=4, 2,20=5, 10,24=6.

The principle feature of the month was the intense magnetic disturbance on 5th and 6th.

SOLAR GEOPHYSICAL SUMMARY — NOVEMBER 1985

Solar activity continued at a low level. Two regions produced a slight chance of activity after the 10th. Both regions decayed as they crossed the disc and rotated off around 23rd. The 10cm flux was enhanced during the passage of these regions across the disc. The peak flux value of 86 was reached on the 15th. The sun was spotless from 1st until the 4th, then 23 until the 30th. For these periods the 10cm flux was in the low 70s.

10cm flux readings were 1,2=70, 3,4=69, 5=70, 6=71, 7=73, 8=75, 9,10=74, 11,12,13=76, 14=78, 15=86, 16=81, 17,18=79, 19,20=78, 21=76, 22,23=75, 24=74, 25=72, 26=71, 27=72, 28,29,30=71. Average was 74.3. Sunspot average was 16.6. Running yearly sunspot number 17.8 for 5/85.

GEOMAGNETIC

2nd-3rd November. . .The field was at active level to minor storm levels after 1200 UTC on 2nd, subsiding to unsettled levels around 1700 UTC on 3rd. A=28,22.

13th November. . .The field was at active levels with the most disturbed period being 1800-2400 UTC. A=22.

27th November. . .The geomagnetic field was at active levels particularly 0300-1600 UTC. A=15.

29th-30th November. . .A geomagnetic storm began at 0708 UTC and developed into a major storm by 1630 UTC. It lasted until 1400 UTC on the 30th when the field declined to active, unsettled levels. A=28,42.

The month was generally quiet with few very disturbed days until late in the month when the major storm started, a result of a coronal hole with the effects of a solar disappearing filament superimposed.

The quietest days were 20=2, 26=3, 24,25=4, 12,21=5.

IONOSPHERIC I INDEX

This index, a measure of the average level of the ionospherical critical frequencies available on a particular day — the higher the value of the I index, the higher the ionospheric critical frequencies (and maximum usable frequencies on HF circuits) for that day. The index is based on data from Australian ionospheric stations and so is most applicable to HF circuits with reflection points in the Australian region. They do not appear in the recorded information available on (02) 269 8614. VK2WI, during it's Sunday Broadcasts, give a weekly summary along with the 10cm flux and A indices for the previous week.

For November they were: 1=—14, 2=—17, 3=—21, 4=—30, 5=—28, 6=—12, 7=—18, 8=—16, 9=—11, 10=—18, 11=—16, 12=—8, 13=14, 14=—3, 15=—29, 16=—18, 17=—14, 18=—7, 19=—2, 20=1, 21=9, 22=—4, 23=—3, 24=—8, 25=—9, 26=5, 27=17, 28=—2, 29=—18, 30=—81 — an average of 3.4.

IPS comments were: *F2 critical frequencies were generally depressed far below IPS predicted values for the month. Due to the combination of low solar flux values early in the month the extended period of slightly disturbed magnetic conditions. The rise in the solar flux which was associated with the growth of the two regions on the sun produced a general rise in the conospheric F2 critical frequencies towards the end of the month.*

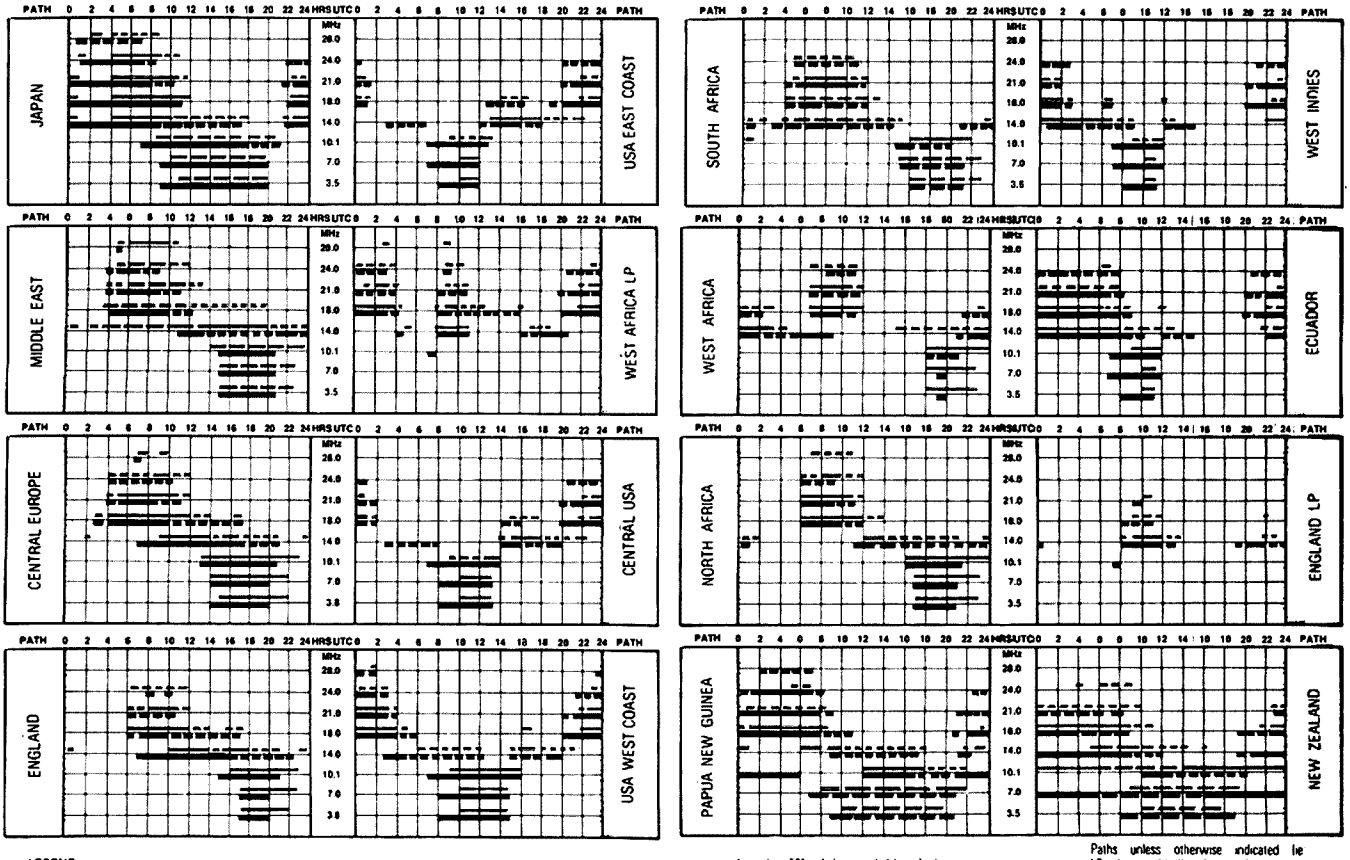
The Southern Hemisphere appears to have been effected by the magnetic disturbances to a greater extent than the Northern Hemisphere. Critical frequencies for the Southern Hemisphere have been mostly lower than equivalent northern values.

From data supplied by Department of Science, IPS Radio and Space Services

AR

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic, 3060



LEGEND

From Western Australia (Perth)

From East Australia (Canberra)

Better than 50% of the month but not every day (continuous lines)

Less than 50% of the month (short broken lines)
Mixed Mode Dependent on angle of radiation (long broken lines)

Paths unless otherwise indicated (ie LP = long path) all paths are short path.
Predictions reproduced courtesy of the Department of Science and Technology, Ionospheric Prediction Service, Sydney.
All times in UTC.

Bill the Author

Ted Holmes VK3DEH
20 Edmonds Street, Parkdale, Vic. 3195

Bill was standing outside his front gate, looking anxiously along the street. It was about time the postman turned up with the latest issue of AR. He had to stand and wait for the postman because his letter box had fallen down and then been run over when Bill was backing his Holden out one day. He hadn't got around to fixing it.

The postman arrived on his bike and gave Bill some mail. It included AR. Bill tucked some letters into his back pocket and meandered into his shack for a quiet read. He had always looked forward to his magazine and today was no exception. He settled down, coolt in at his elbow, and started.

What was this? Computers again! There seemed to be more articles about the blessed things. Didn't they know that he wasn't interested in computers? Where were the articles about building things from junk boxes? What's all this about Packet Radio? Not to mention the satellite business. It was enough to drive any reasonable man to drink!

Bill sipped thoughtfully. It was about time they realised that this couldn't go on. He decided to write a Letter to the Editor about it. He hunted around until he found a fairly clean piece of paper and then sat and thought.

"Dear Sir, or Whom it May Concern", he wrote. No, that wouldn't do. He crossed it out.

"Dear Sir". That wouldn't do either. The Editor could be a woman. You never knew; they seemed to get into everything these days. He crossed it out again.

"Dear Sir or Madam". That would do. *"I wish to bring (cross out) draw your attention to the fact that your magazine is getting (cross out) becoming more and more addicted (cross out) involved in printing articles about those damned (cross out) internal (cross out) computers. I should (cross out) would like to tell (cross out) let you know that I and many others are not the slightest bit interested in the things. Could (cross out) I request that more articles are printed about things that interest real people"* — Bill liked that bit — *"and not a minority of boffins. I remain, Dear Sir or Madam, whatever the case may be, William Blitheringtwit, Licence Holder of many years' standing"*.

Bill read it through. Of course, it was only a rough draft, but it read well. It was about time somebody put a word in about this sort of thing. He took another sip at his can. Perhaps he could write an interesting article himself. After all, he had many years' experience which he could share with other less knowledgable people and, in this way, could guide them along the right track. He made a mental note to get hold of an old typewriter.

Mrs Blitheringtwit then yelled at him from the kitchen. Something about some letters. In the interests of peace, Bill hastened out to find out what she wanted.

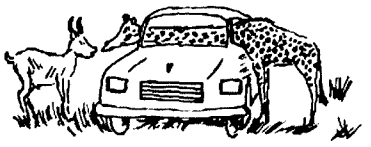
The breeze of his passing caused his composition to float off the desk and descend to the cluttered floor, where it remained unnoticed. Bill then totally forgot about the whole idea.

AR

CARNAPPING PREVENTION TIPS

Always lock all car doors when parking
Never stay inside the car when it is parked
Take your family members with you when you park
Install safety and alarm devices whenever possible
Clear the area of suspicious looking people before boarding or parking your car
Always park in illuminated areas at night
Remove all valuables from inside the car before parking is to preclude temptations
Never entrust your car key to anybody else to preclude duplications of same
Avoid hitch-hikers, especially beautiful women
Park your car in secured areas as much as possible
Provide necessary information to area security personnel of suspicious persons
Install a hidden master switch whenever possible
Never leave car windows open, especially during traffic jam
Secure and lock garage doors at all times
Drive your car to crowded areas if suspicious of being followed
Remove vital spare parts like the rotor before leaving your parked car
Verify prospective buyers before entrusting them with your car for testing purposes
Entrust car keys to management when delivering the car for repair purposes

From PARA NEWS, September 1985
AR



DEADLINE

All copy for inclusion in the May 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 19th March 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

ΞTRADE ADSΞ

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x220mm SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. (No inquiries at office ... 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Rozelle, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT

ΞWANTED — ACTΞ

TRANSCEIVER: 2m either portable or h'held in VGC, eg FT-290R. Also accessories: mic, charger, extra antennas, etc. Please contact Dan VK1ST, QTHR. Ph: (062) 58 5664 AH or 46 6296 BH.

ΞWANTED — NSWΞ

QST MAGAZINE JULY 1985: Please contact Mrs Hill at Falser Russel, 140 Phillip Street, (02) 221 1655 for Prof G Falser VK2ZGF

TRIBAND BEAM ANTENNA: Hy Gain for 10; 15 & 20m. Garnet VK2CGF Ph: (065) 53 7539.

ΞWANTED — VICΞ

BFO COIL: to suit CR-100 or B-28 rx. Will purchase wrecked chassis. Controller to suit WWII MN-26 Radio Compass Type H, L or N. Frequency range 200-410kHz, 550-1200kHz & band 3 is 3MHz to 6MHz. VK3AQB. Ph: (03) 337 4902.

COMPLETE SET OF AMATEUR RADIO: for 1978. The Federal Office set have been borrowed and not returned. Costs reimbursed. Box 300, Caulfield South, Vic. 3162. Ph: (03)528 5962.

ΞWANTED — QLDΞ

HANDBOOK FOR AVO VALVE TESTER: Model CT-160, circuit for Hammarlund Super PRO (early model) & dual gang wide spaced variable capacitor 200pF max approx. Len VK4JZ, 33 Hill Crescent, Carina Heights, Qld. 4152. Ph: (07) 396 2002 AH.

POWER SUPPLY: Filter chokes 2.5H, 1A, 250V or better. Ken VK4JPE (ex 4TPE), QTHR. Ph: (079) 27 1966 BH.

ΞFOR SALE — ACTΞ

YAESU FT-107DM: 100W tcvr. Incl in-built AC power supply,Memory module, WARC bands, $550 incl freight ONO. Realistic DX-302 rx. Covers 100kHz-30MHz in 6 bands. 12V or 240V operation. Ideal for SWL. $200 incl freight ONO. Alan VK1KAL, QTHR. Ph: (062) 56 2568 AH or (062) 58 8115 BH.

ΞFOR SALE — NSWΞ

ICOM IC-701 HF TCVR: PS-701 Power Supply ICRM-3 Controller. All in Ex Cond. $690. Roger VK2DNX, QTHR. Ph: (02) 546 1927.

YAESU FC-700 ANTENNA COUPLER: Unused — cost $166, sell for $100. Geoff VK2POA, QTHR. Ph: (02) 467 2663.

YAESU FT-7B TCVR: 100W mobile $400. Icom IC-4E 70cm FM h-held, charger & spkr/mic $300. FDK Multi-7 2m FM tcvr. Rep 2, 3, 4, 6, 8, Ch 50. $180. Ken KP-202 2m FM h-held Rep 2, 3, 6, 8, Ch 50. $110. Realistic DX-150A HF gen cov rx $150. VK2CMM. Ph: (0648) 24 124.

ΞFOR SALE — VICΞ

ASSORTED TRANSFORMERS: $8 each; BWD CRO 503 in EC. $140. Rotator Med Duty C400DS & control $160. Power Supply, 7A cont, 10A pk, Dual meters, etc. $100. Heathkit IM-16 VOM $40. GDO $60. ATV Road Show B/W camera, tx rx & manual $170. 4CX250B 150k & fans, bases, stacks. 803 & base $120 the lot. 2 x 5 el beam. 8m or retune for 10m. Werner fittings. $100 each. Mal VK3KSA, QTHR AH.

TRANSCEIVERS: HF SB-34 brand made by Sideband Engineers USA. Compact size 240V/12V. 1 mint, 1 rough for spares. Lots of data and PA valves. Faults in both but cheap at $75 for two. Hidaka 20, 15, 10m trap vert ant. $45. Peter VK3APS, QTHR. Ph: (03) 836 7458.

VIBROPLEX — THE ORIGINAL BUG: in immac cond, used less than 6 months sparingly. Landed cost today $150, sell for $75 plus postage. Roth VK3BG. Ph: (03) 870 3333 BH.

ΞFOR SALE — QLDΞ

APPLE II COMPATIBLE COMPUTER: with disk drive, 80 col/64k card, PAL colour card, Joy-stick. $750 ONO. VK4OA, QTHR. Ph: (071) 21 5742.

TUBES: Eimac 3-500Z, 30 hrs light usage $350 pair or $175 each. (sockets available). QB3-300A/4-125A — new & used. Vacuum variable caps, 5-50pF 5kVW $50 each. Blower to suit 4CX250Bs + 110/240V AC. Brand new $50. Numerous other bits & pieces. John Bisgrove VK4ZJB, QTHR.

ΞFOR EXCHANGE — VICΞ

TRIBAND HF CE-35DX BEAM: 5 elements with Wilson traps. Excellent VSWR & works well. Exchange for 3 element heavy duty tri-band beam. TH-3 Mk 2 or 3 or similar. Mal VK3KSA, QTHR AH.

bkp-mar005aa

Advertiser's Index

KENWOOD

TOMORROW'S SOPHISTICATION FOR TODAY'S ENTHUSIAST

TS-940S

THE FREQUENCY BAND PROGRAMMING OF THIS UNIT IS NOT DEPENDENT ON A BATTERY. SOME BRANDS MUST BE RETURNED TO THE IMPORTER FOR REPROGRAMMING SHOULD THE BATTERY BE DISCHARGED.

The TS-940S is a competition class HF transceiver having every conceivable feature, and is designed for SSB, CW, AM, FM and FSK modes of operation on all 160 through 10 meter Amateur bands, including the new WARC bands. It incorporates an outstanding 150 kHz to 30 MHz general coverage receiver having a superior dynamic range (102 dB typical on 20 meters, 50 kHz spacing, 500Hz CW bandwidth).

PRICES RISING! Buy NOW before Dollar drops further

TS-430S

The TS-430S combines the ultimate in compact styling with its counterparts in advanced circuit design and performance. An all solid-state SSB, CW and AM transceiver, with FM optional, covering the 160 — 10 meter Amateur bands including the new WARC bands, this remarkable radio also incorporates a 150 kHz — 30 MHz general coverage receiver having an extra wide dynamic range.

TRIO-KENWOOD (AUSTRALIA) PTY. LTD.

(INCORPORATED IN N.S.W.)

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

Further, beware of dealers not listed in this advertisement who are selling Trio-Kenwood communications equipment. All Kenwood products offered by them are not supplied by Trio-Kenwood (Aust.) Pty. Ltd. and have no guarantee applicable

YOUR DEALER BELOW WILL GUARANTEE SATISFACTION

NEW SOUTH WALES

TRIO-KENWOOD (AUST.) P/L—4E WOODCOCK PLACE, LANE COVE (02) 428 1455
EMTRONICS—94 WENTWORTH AVENUE, SYDNEY (02) 211 0988
WASSIL ELECTRICAL—71 SUMMER STREET, ORANGE (063) 62 6249
REG STOCKMAN COMMUNICATIONS—CNR BANOCKBURN RD. & SHIRLEY ST., INVERELL (067) 22 1303
ELECTRON 2000—3 ELIZABETH STREET, TIGHES HILL, NEWCASTLE (049) 69 6399
WORMALD COMMUNICATIONS—51 DENNISON STREET, HAMILTON, NEWCASTLE (049) 69 1999
MACELEC PTY. LTD—99 KENNY STREET, WOLLONGONG (042) 29 1455
E&K COMMUNICATIONS—14 DUTTON STREET, DICKSON, A.C.T. (062) 49 6437
DX ENGINEERING—5 JASMINE STREET, PORT MACQUARIE (065) 82 0175
FRANK BOUNDY—LISMORE (066) 86 2145

INTERSTATE

VIC: EASTERN COMMUNICATIONS—168 ELGAR ROAD, BOX HILL (03) 288 3107
PARAMETERS PTY. LTD—1064 CENTRE ROAD, SOUTH OAKLEY (03) 575 0222
AM-COMM ELECTRONICS—69 CANTERBURY ROAD, EAST CAMBERWELL (03) 836 7634
BRIAN STARES—11 MALMSBURY STREET, BALLARAT (053) 39 2808
SUMNER ELECTRONICS—78 KING STREET, BENDIGO (054) 43 1977
TAS: HOBBY ELECTRONICS—477 NELSON ROAD, MT. NELSON (002) 23 6751
WATSONS WIRELESS—72 BRISBANE STREET, HOBART (002) 34 4303
ADVANCED ELECTRONICS—5A THE QUADRANT, LAUNCESTON (003) 31 7075
MARINE & COMMUNICATION—19 CHARLES STREET, LAUNCESTON (003) 31 2711
V.K. ELECTRONICS—214 MOUNT STREET, BURNIE (004) 31 7733
QLD: MITCHELL RADIO CO—59 ALBION ROAD, ALBION (07) 57 6830
S.A. & NT: INTERNATIONAL COMMUNICATIONS SYSTEMS PTY. LTD—8 NILE ST., PORT ADELAIDE (08) 47 3688
W.A.: ARENA COMMUNICATIONS SERVICES—642 ALBANY HWY., EAST VICTORIA PARK (09) 361 5422
TRI-SALES—CNR NEWCASTLE & CHARLES STREET, PERTH (09) 328 4160
WILLIS ELECTRONICS—165 ALBANY HIGHWAY, VICTORIA PARK (09) 470 1118
BAY RADIO—22 GRACE STREET, FERNDALE (09) 451 3561
FORD ELECTRONICS—209 HANCOCK STREET, DOUBLE VIEW (09) 446 4745

Your entire spectrum? Covered!

Icom's latest dual band IC-3200A delivers a powerful 25W punch at VHF & UHF. Big performance. Small size. *Lowest price dual bander on the market.

HF, VHF, UHF: Icom's spectrum of technology.

An ultra compact 100W HF transceiver small enough to go mobile. The IC-735 combines size, superior performance, & FM, CW, LSB, USB, AM to become a new HF standard: yet the simplified front panel makes the IC-735 easy to use, even when mobile.

Powerful, clean performance in the bands you use most. Icom's team perform for you at your local authorized dealer.

Like a brochure? Send us your name & address.

Simply the best.

ICOM

7 DUKE STREET, WINDSOR, VICTORIA. 3181 PHONE (03) 51 2284

* At the time of publication

ICO024

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

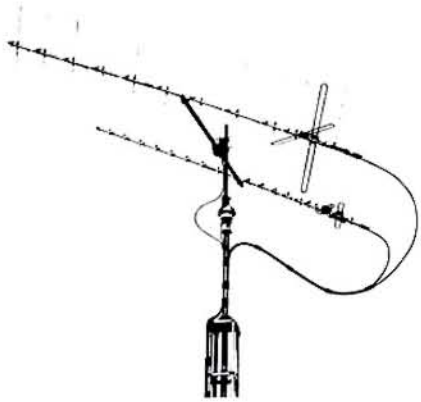
VOL 54, No 4, APRIL 1986

Will
HALLEY'S COMET
affect radio propagation?

To construct:
DUAL LED LEVEL INDICATORS
4 WATTS, 80 METRE CW TRANSMITTER
for under $40
HALO for 6 METRES

Band Plans for
VHF & UHF
3.5GHz WORLD RECORD
claimed by Australians

SATELLITE ANTENNAS for OSCAR 10



WHS32

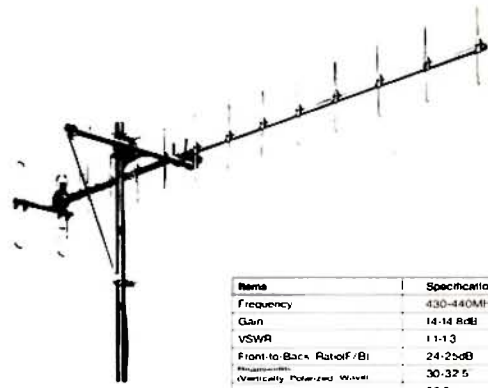
Circularly Polarised Wave; High performance using High Quality Materials.

Since the maximum gain of the transmission antenna on 430MHz is 13.4dB, and the maximum gain of the reception antenna on 144MHz is 12dB, top reception is achieved without the use of a preamplifier.

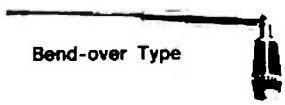
Items	430MHz Band	144MHz Band
Frequency Range	430 - 440MHz	144 - 146MHz
Polarization	Circularly Polarized Wave	
Gain	12.5 - 13.4dB	10 - 12dB
VSWR	1.1 - 1.5	
F/B	16.5 - 18.3dB	20.7 - 22.5dB
Beamwidth	27 - 29	33 - 35
Impedance	50Ω	
Withstanding Power	100W	
Weight	Approx. 8.7kg	
Length	3.68m	4.11m
Radius of Rotation	Approx. 2.6m	
Connector	N-Type	

50TS

Frequency Range: *50-54MHz*; Gain: *7.1-7.9dB*; VSWR Zo=50Ω: *1.1-1.5*; Front-to- Back Ratio (F/B): *14.4 — 20.1dB*; Beamwidth: *50pi9021 ~ 56pi9021*; Impedance: *50- 75Ω*; Withstanding Power: *50W*; Weight: *5.9kg*; Length: *4.32m*; Width: *3m*; Radius of Rotation: *Approx 2.62m*; Wind Load Area: *0.36m²*; Applicable Mast: *∅32 ~ 60.5mm*; Applicable Cable: *5D, 8D, 5C, 7C*.



Items	Specifications
Frequency	430-440MHz
Gain	14-14.8dB
VSWR	1.1-1.3
Front-to-Back Ratio(F/B)	24-25dB
(Vertically Polarized Wave)	30-32.5
Impedance	50Ω
Withstanding Power	100W
Weight	Approx. 2.7kg
Length	2.45m
Width	0.33m
Radius of Rotation	Approx. 1.5m
Wind Load Area	0.17m²
Adaptable Mast	∅32-60.5mm
Adaptable Cable	8D2V, 10D2V



Bend-over Type

ARM5

ARM2

28P41L

Frequency Range: *28 – 29.7MHz*; Gain: *0dB*; Impedance: *50Ω*; VSWR: *1.2 (at adjusted frequency)*; Withstanding Power: *100W*; Length: *Approx 1.9m*; Weight: *Approx 360g*.

144PWL

435PWL

MODEL	Frequency (MHz)	Gain (dB)
144PWL	50 ~ 54	0
(2-Band Type)	144 ~ 148	2.2 ~ 3.2
435PWL	144 ~ 148	1.7 ~ 2.8
(2-band Type)	430 ~ 440	5.1 ~ 5.5

VSWR	Length (m)	Weight Approx (g)	Accessories
1.2 ~ 1.5	1.26	260	Hex Wrench
1.05 ~ 1.7	1.26	260	Hex Wrench
1.1 ~ 2	0.91	270	Hex Wrench
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Twin interplanetary probes — Sakigake and Suisei — which were launched by Japan to intercept Halley's Comet. (See page 5).

Technical Features

Special Features

Regular Features

Amateur Radio

Published monthly as the Official Journal by the Wireless Institute of Australia, founded 1910. ISSN 0002 — 6859. Registered Office: 3/105 Hawthorn Road, Caulfield North, Vic. 3161. Telephone: (03) 528 5962.

For most people, viewing Halley's Comet is a "once-in-a-lifetime" experience as it only appears every 76 years. This month, April, is expected to be the best time to view this legendary Comet. Will it affect radio propagation? Will the moonbounce operators be able to bounce signals from Halley's Comet? Each time it re-appears technology and science is a little more advanced and technical people are able to learn a little more about it. 1758 was the first time the Comet's return was scientifically predicted. High quality telescopes were used to make accurate drawings in 1835, and in 1910 it was photographed in detail by high-powered telescopes. This time several spacecraft probes. An artists impression of two interplanetary probes, Suisei and Sakigake, are featured on this month's cover whilst on page 5, there is the article Halley's Comet — will we see it?

In Novice Notes, page 20, Drew VK3XU, has designed a nifty little four watt transmitter for 80 metre CW. Drew has approached this transmitter from two angles — in semi-kit form or construct it from the ground including making the PCBs yourself. In the kit-form the unit is very cheap and Drew is very interested to hear what readers think of this approach to simple construction.

For the VHF UHF enthusiasts, page 24 features the Band planning for your frequencies, whilst in the regular VHF UHF column there has been a new world record set for the 3.5GHz band by two Australians. Congratulations to Reg VK5QR and Wally VK6WG.

DEADLINE

All copy for inclusion in the June 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st April 1986.

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Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, *by the* 22nd *day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Watch the space below the index for deadline dates. Phone: (03) 528 5962.*

HAMADS should be sent direct to the same address, by the same date.

Acknowledgement may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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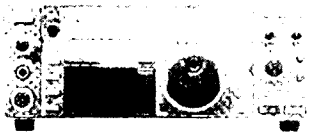

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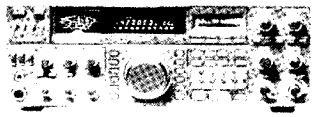

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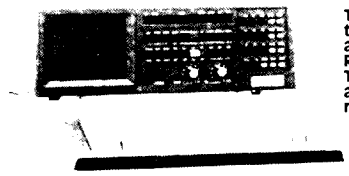

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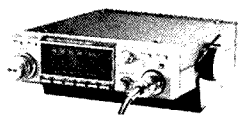

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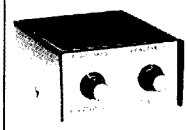

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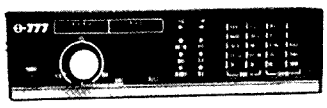

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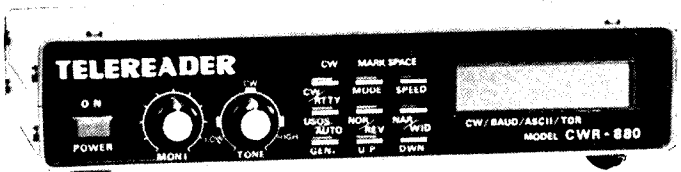

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Editor's Comment

BITS AND PIECES

The above title is a phrase beloved of an old friend of mine who recently succeeded in jumping the five words-per-minute hurdle after 27 years and graduated from a Z to a K call. He would probably not want to be identified here, but he will know to whom I send congratulations! By *bits and pieces* he sometimes meant things like resistors or nuts and bolts, but more often a collection of unrelated items all of some interest at the time. That describes this editorial very well. I think I have said before how impressed I am by the ability of newspaper columnists to come up with something readable, not once a month, but every day. And like some of those columns this month's offering is a collection of unrelated bits.

One thing that has stirred many to comment over the last few weeks has been the article by Jim VK3PC and Roger VK2ZTB, which we published in February. Some are for, some against. Some are critical of the manner of its publication. But it must be made clear that **It is only a discussion paper.** Its purpose is to provoke comment and discussion. **It is not WIA policy.** Some, perhaps most of its arguments will be discussed, formally or otherwise, at our 50th Federal Convention later this month. Some may become Institute policy this year. Or next year, sometime, or never. It all depends on the opinions of you, the members. Tell your Divisional and Federal Councillors about **your** opinions. They may be experts in telegraphy or telephony, but probably not telepathy!

I had hoped by now to have written an account of the very enjoyable trip my wife and I made last year to VK4 and VK8. Rest assured, amateurs of Cairns, Darwin, and elsewhere, that it will be done eventually. Time is the problem. Incidentally, I hope Cyclone Winifred did not change Cairns too much from the way it was in August.

We have announced in the last two months the winners of the four main Federal Awards. Two were endowed by Alan Shawsmith VK4SS and Ron Higginbotham VK3RN. A third was set up in memory of the late Ron Wilkinson VK3AKC. The fourth is the Publications Committee Technical Award. It has become obvious that these awards are not as well-known as they should be. In fact, they have been won from time to time by people who did not even know of an award's existence until they had won it! We will try to make them better known by a series of articles during 1986 in which the history and purpose of each award will be covered. All but the Ron Wilkinson Award are judged on contributions to this magazine over a calendar year. As the Sage of Oz said years ago *You've gotta be in it to win it!* so let us have your technical or general interest articles to include in the list. Some Divisions also make awards to authors of Amateur Radio articles. You may never win a Nobel Prize, but how about a WIA Award? **Over to you.**

Bill Rice VK3ABP
Editor
AR

HOBBY ON A TABLE

Allan Williams VK2FH has seen a big change in technology. Two years ago Allan was using thousands of dollars worth of equipment which filled a room, today his electronic equipment fits on a small table.

Allan became interested in radio during his primary school days, and continued through during his studies at Sydney University. but it was not until 1947 that Allan became licensed. On 16th February 1948, he joined the Institute.

Allan well remembers the flood emergency of 1955, which was mentioned in the Obituary for Kevin Watson, page 62 February. AR, and the part various members of the WIA (NSW Division) played. Allan, using the VK2WI call sign at the time, recalls how Kevin retired from the Emergency Net on 40 metres only to return a very short time later from a higher location.

The net consisted of Peter Alexander VK2PA, at Port Macquarie on the Hastings River, Noel Hansen VK2AHH, at Kempsey on the Macleay River, Crief Retallick VK2XO, at Raleigh on the Bellinger River, there was a station at Lismore on the Clarence, Russ Watt VK2WT, at Tenterfield, Jack Hill VK2ADT, at Inverell, a dentist at Narrabri worked into Sydney for days using an ATR2B transceiver which was air-dropped to him by the Disposals Committee, there was another station situated at Dubbo on the Macquarie and Hugo Stitt VK2WH was at Forbes on the Lachlan. The state was well covered.

Several others, such as John VK2AMV, Trevor VK2NS and Harold VK2AHA assisted along the way.

Such was the value of the work done by these amateurs and their second operators that Jim Corbin VK2YC, President of the WIA NSW Division, was awarded an Order of the British Empire (OBE) in recognition of the work done by members during the horrific floods.

In some ways the floods could not have come at a better time as amateurs were arguing strongly with bureaucracy not to take or curtail the best amateur bands. The plan was to allocate, amongst other things, 40 metres to commercial allocations — this was the band in which the majority of the emergency traffic was handled most reliably. Using the Flood Emergency Net operations amateurs were able to retain the 40 metre band to the limits that we have today.

The ATR2B was only one piece of equipment used during the emergency. There were Command receivers and transmitters taken from war surplus, No11 and No19 AWA equipment which had been taken from Bren Gun Carriers, tanks, etc.

Most of the equipment used 12 or 24 volt DC battery power supplies to operate generators which stepped-up the voltage to 240 volts DC or 300 volts on transmit.

So long as one could keep the batteries going the equipment proved excellent for portable gear — particularly when the AC was not operational due to rising flood-waters.

The NSW Disposals Committee purchased and sold thousands of war surplus radio items after WWII to satisfy the needs of the equipment hungary members of the WIA. The Disposals Committee consisted of Jim VK2YC, Alec Dan VK2ABU, Chairman, Harry Solomon VK2AJZ, Bert Hayes VK2AGW and Allan VK2FH. (Note: All but Allan and Alec are now SKs).

The Committee bought items for threepence (about 3 cents) and sold them for five shillings (50c), making a profit which added up to a considerable sum in those days. The question then arose; What to do with the money?

Members were wanting to move their monthly meetings from Science House, Gloucester Street, in the City, to a more accessible location at about the same time so it wasn't hard to find a use for the money. Atchison Street at North Sydney was purchased by Jim and Alec with the profits from the disposals sales and members then had their own Club Rooms. There were some objections from members as the location was not that central to members from the sprawling Southern and Western Suburbs but Atchison Street did become a prime piece of real estate.

Dural, five acres of thick bushland, was purchased as a location for VK2WI, using NSW Divisional funds.

The Division now had an electrically quiet site on which to build a communications headquarters (to be used in future emergencies such as the floods) and a club house as well.

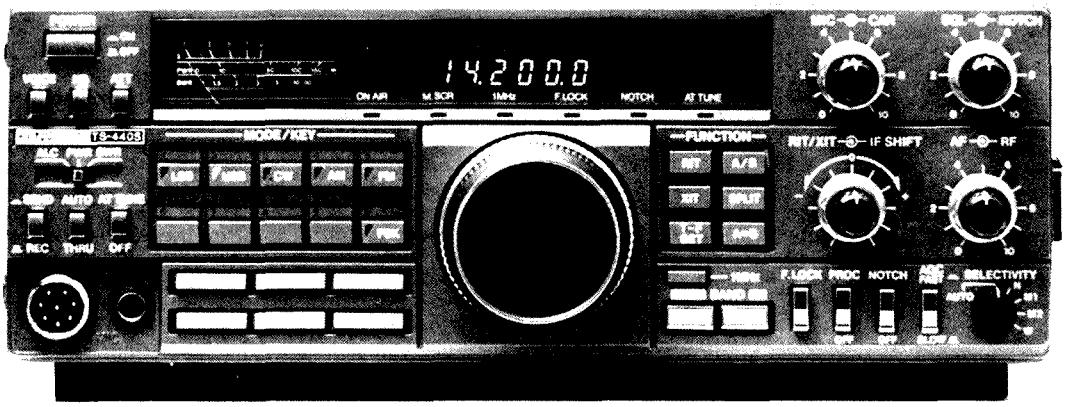
Compiled from information supplied by Allan Williams VK2FH
AR

FOOTNOTE: Three years ago, Allan donated all his very old amateur equipment to the WIA NSW Division and replaced his old equipment with new, modern gear. Recently he was asked by the local newspaper to explain something of amateur radio to the readers. Allan's recollections for the paper *The Mosman Daily* and the reference to the 1955 Floods in Amateur Radio prompted him to write some notes of amateur radio within the NSW Division around the mid-50s. Many of the call signs have now been re-allocated as the original holders are silent keys.

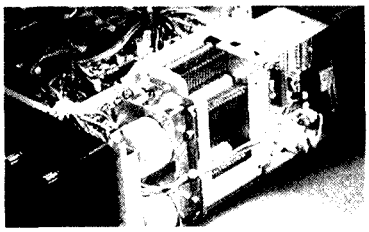
Photograph courtesy of The Mosman Daily.

Allan VK2FH, operating his modern day station.

KENWOOD



TS-44S



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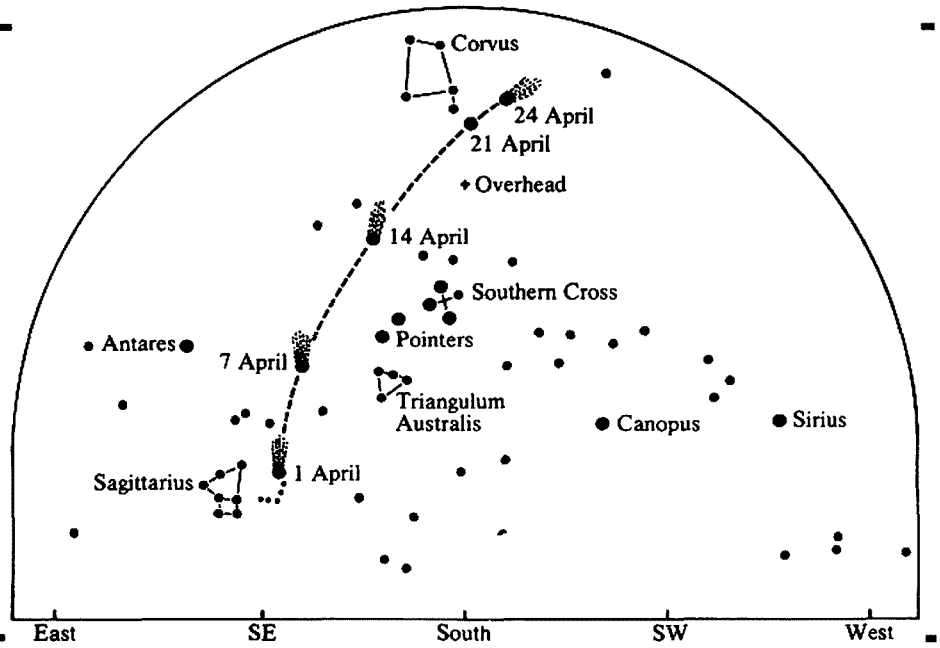
PO Box 39, Mooroolbark, Vic. 3138

HALLEY'S COMET — WILL WE SEE IT?

Depicted on the front cover is Halley's Comet, a phenomenon not witnessed for three quarters of a century. When last seen, there was not the sophisticated equipment and resources that are available today to track it and find out just that little more about it.



The cover design depicts the on-going global research program that Japan's Institute of Space and Astronautical Science has instituted and features the two inter-planetary vehicles that were sent to welcome Halley to our viewing. The probes named *Sakigake* meaning Pioneer and *Suisei* meaning Comet were due to intercept the Comet last month, shortly after its closest approach to the sun.

The duties of these deep space probe explorers was to gather invaluable data on solar winds, waves of plasma emitted by the sun and its effect on the Comet. Suisei, (or Comet) is intended to reveal the three dimensional structure of the hydrogen cloud surrounding the coma with an ultra-violet television camera which will beam the images back to earth from a distance of up to 170 million km away. No mean effort! !

Sakigake and Suisei were launched to gain more knowledge of this rare visitor. The USSR, NASA and others have also sent vehicles into space in the hope of gleaning a little more knowledge of this phenomenon. The 64 metre Parkes radio telescope, in New South Wales, will be a sole receiver to a probe launched by the European Space Agency.

All the information gathered will be available to eagerly awaiting scientists world-wide.

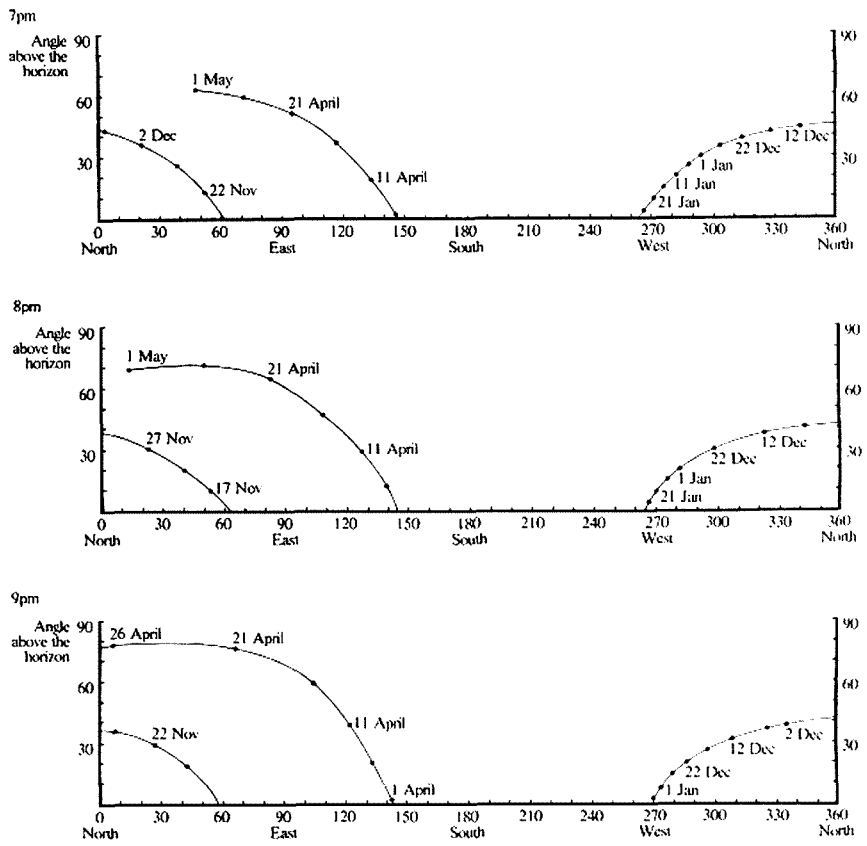
Dr Robin Hirst, Curator of Astronomy at the Museum of Victoria, in collaboration with Dr Denis Coates, a Senior Lecturer in the Department of Physics at the Monash University, have graciously allowed me to use extracts from their book *Halley's Comet - an Australian view 1985/1986*, which i recommend to all readers for a concise review of this history-making event. It is obtainable from the Melbourne Museum Bookshop for $2.95 plus postage and packing.

HALLEY

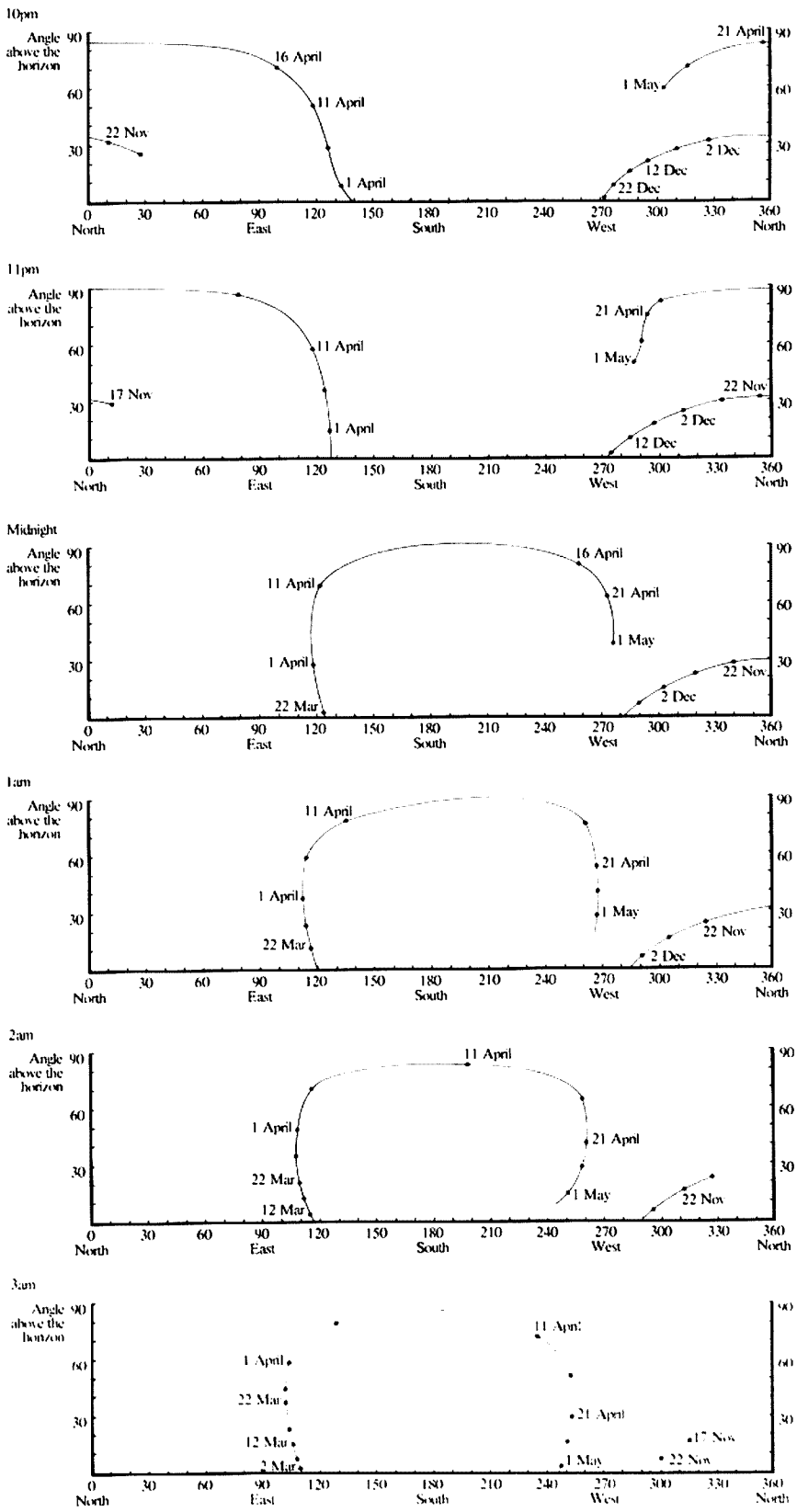
Halley's Comet was first recorded in 240 BC, when it was recorded in Chinese records, but it was not named until 1758. Edmond Halley, a keen English astronomer, later Astronomer Royal, was in his mid twenties, when he plotted the orbit and correctly predicted the Comet's return in 1758.

It was sighted in 1758, by an amateur astronomer, Johann Palitzsch, confirming Halley's prediction, and the Comet was subsequently named after Edmond. To this date there have been 30 recorded return sightings including those of two astronomers who working at the Hale Telescope on Palomar Mountain, when the Comet was detected whilst some 1 600 million kilometres from earth in 1982.

Following are a set of diagrams showing where the Comet will be each hour of the night. Select the time of night you wish to observe and select the appropriated diagram. You can then calculate the position of the Comet on the particular date. It is also possible to determine how far around the horizon it will be and how high it is in the sky. Eg: On 11th April, at 8pm, It will be 130 degrees Eastward from North and 30 degrees above the horizon.

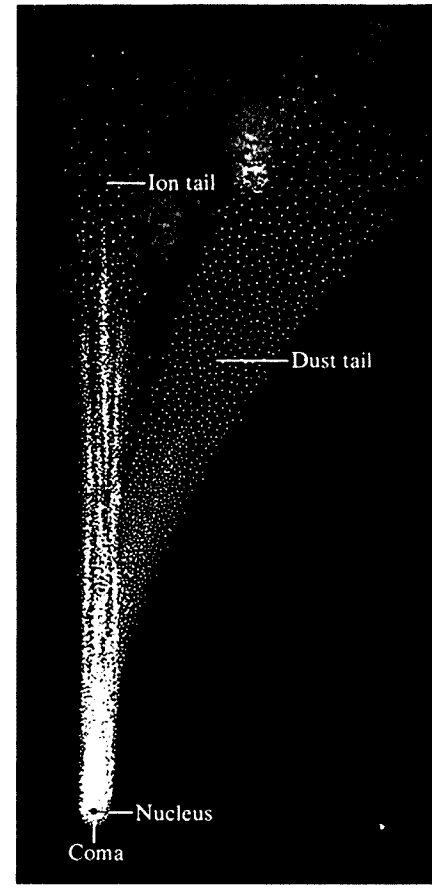


Halley's Comet is a fluffy, dusty snowball about 10 kilometres across and is part of the Solar System, trapped by the sun's gravitational pull. Its distance from the sun



varies between 90 and 5 thousand million kilometres from the sun.

It began its present return trip towards the sun in 1948, travelling at about 3 000 kilometres per hour. At this time, the Comet was just a *nucleus* of deeply frozen dust and



Parts of a comet.

ice, with a temperature of about -200 degrees Celsius. As it approaches the sun it gradually warms, and the ice turns to water vapour. Other ices in the Comet, such as methane and ammonia, also evaporate.

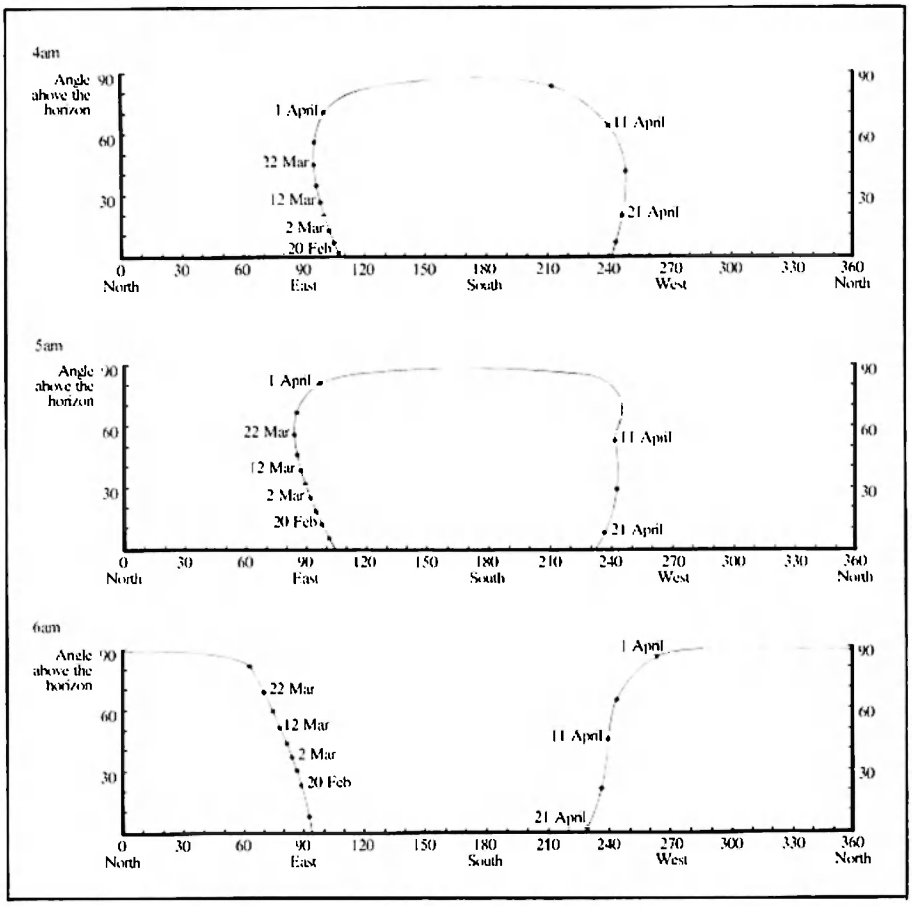
The Comets is now surrounded by a cloud of vapour and gas mingled with dust, forming the Comet's *coma*. This coma can reach nearly a million kilometres in diameter. Also two tails form — the *dust tail* formed when the rocky dust in the coma is pushed away from the sun, and the *ion tail* which consists of electrically charged molecules from gas in the coma.

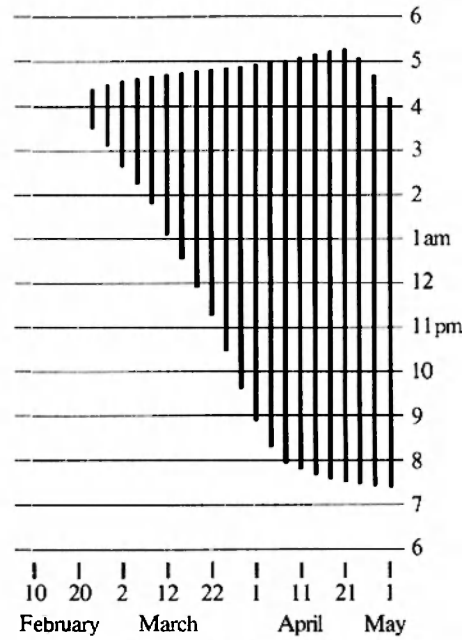
Usually these tails point in different directions, however, on this visit, it will be difficult to see them separately.

Each passage of Halley near the sun removes a one-metre layer of ice and dust from the surface of its nucleus. Most of the lost material is strewn along the Comet's track and the lightest particles are eventually pushed completely out of the Solar System. These particles stay spread along the track, with the result that when the earth passes through the dust trail twice a year, some of the particles enter the atmosphere, which in turn produce meteor showers. Halley's showers occur in early May (the Aquarids) and late October (the Orionids).

Halley's is only one of about 700 comets of which detailed information is known, but it is likely that 100 000 000 000 comets surround the sun in a vast cloud.

The Comet was first photographed in 1910. On this visit the earth passed very close to the Comet's tail and there were wild rumours that poisonous gases would have a disastrous effect. Some people plugged cracks in windows and doors to prevent the gases destroying them, whilst the more enterprising sold "comet pills" which would protect those





A graph indicating the time of night Halley's Comet will be in the sky.

The best time to view Halley will be during the second week of this month when it will be in the sky all night and the tail should be clearly visible and should not be affected by moonlight.

REQUESTS

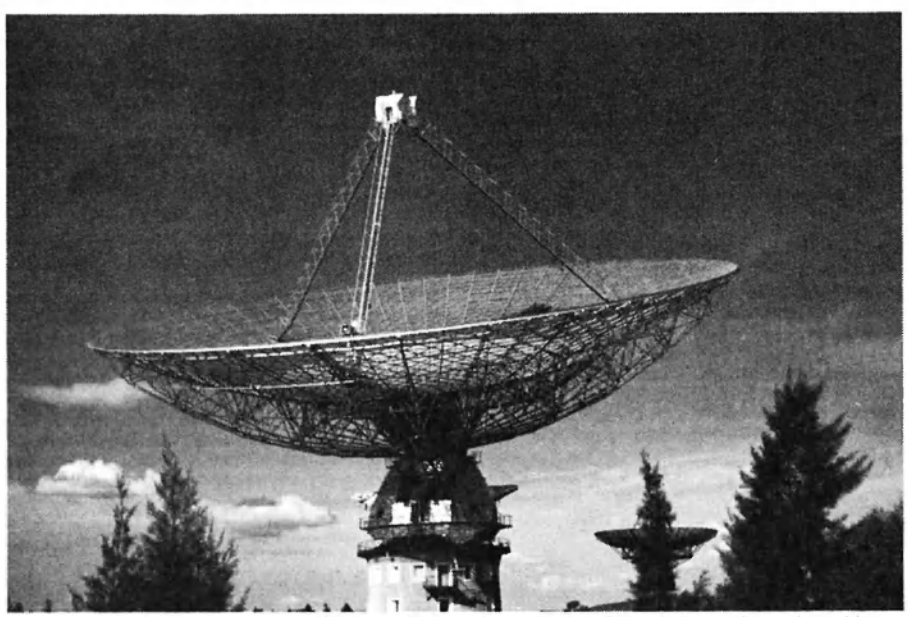
It is requested that any unusual radio propagation or phenomena that is encountered during the sighting period be logged in UTC date and time and either forwarded to Denis or Robin, or to the writer who will gladly pass the information on to them to add to the scientific data that has already been received.

Another request is for anyone who sighted the Comet on its last orbit in 1910 and have seen it again to please advise the writer for publication so that it may be historically recorded for future generations.

THANKS

It would be impossible to list all who have contributed to this article but sincere thanks are extended to the staff of the Japanese Institute of Space and Astronautical Science, the Japanese Ministry of Education, the Consul for Japan and staff, NASA, ITU Magazine, Drs Robin Hirst and Denis Coates, the staff of the Museum of Victoria Bookshop and Ms Julie Lane of Quadricolor International. Sincere thanks to one and all and also those not listed.

AR



The Parkes Radio Telescope will play an integral part in receiving information relayed by the interplanetary probe *Giotto*.

who swallowed them from the effect of the Comet.

WHEN CAN WE SEE IT?

According to the explicit diagrams provided by Denis and Robin and reproduced with their consent, the figures for viewers in the southern states can be easily read. A few simple calculations for those people, in the northern states, who luckily enjoy warmer weather will indicate their window for a view of a sighting before another 76 years elapse.

When the Comet is closest to the earth on this visit, during this month, it will be three times further away than during its closest approach, in May 1910, it will therefore appear fainter than it was in 1910.

Edmond Halley (1656-1742).

TWO-RING HALO FOR SIX METRES

Bill Lochridge VK4WL
C/o Post Office, Thursday Island, Qld. 4875

During 1984, I read a magazine article describing the construction of a single ring, gamma-matched halo antenna. From my experience, this configuration, although providing an excellent radiator, was restricted in its use by its very narrow-bandwidth characteristic.

In the late 50s, a six metre, three ring halo was available on the American market and covered the 50-54MHz band. This antenna had an outstanding SWR which did not exceed 1.8:1. The Saturn 6, as it was called, was robust, very good for trimming trees (when used mobile!), but, importantly, it remained in-tune. It was, however, quite expensive. Unfortunately, I cannot recall how it was fed. With this background, one of my novice students and I set-out to build a two ring halo.

The two ring halo is basically nothing more than a folded dipole bent into a circle, 508mm (20") in diameter, using capacitor plates at the open ends for tuning to resonance. A folded dipole has a feed impedance of about 300 ohms and to transform this value to 50 ohms, the upper ring is constructed of 20mm tubing, whilst the lower one is 8mm.

At this point, it is important to stress that in Cape York, northern Queensland, where the author lives, the nearest hardware store is about 800km away and the price of any item is three to four times greater than it would be in Brisbane. Fortunately, there is a very well-equipped rubbish-tip. Luckily, two 1.8m (6') lengths of 20mm and 8mm aluminium tubing were located there for about $11.50. Some 3mm plate was also found for the capacitor plates.

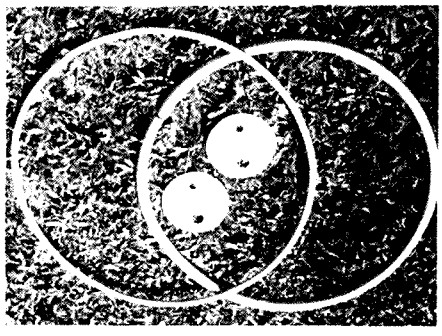
The next problem was to bend the tubing as there were no tree-trunks with a 508mm (20") trunk! A further search of the tip unveiled a 405mm (16") bicycle tyre-rim. One end of the tubing was crimped in a vice, the tubing was filled with beach sand (there is an ample supply of sand around Cape York) then the other end

Halo Rings and the Tyre Rim which they were bent on.

was closed off, again with the aid of a vice. The tyre rim was then placed in the centre of the tubing and both were then clamped in the vice.

With the student on one end and the writer on the other the tube was bent around the rim, overlapping as far as was possible. When the tubing was released it sprang out to approximately the required size. (When one lives in the *bush* one learns to adapt!). All that remained to be done now was to pull the tubing apart to make a 508mm (20") OD circle and to cut and align the ends. (See photograph).

Two 114mm (4.5") capacitor plates were cut using a nibbler tool. The two tubes were set

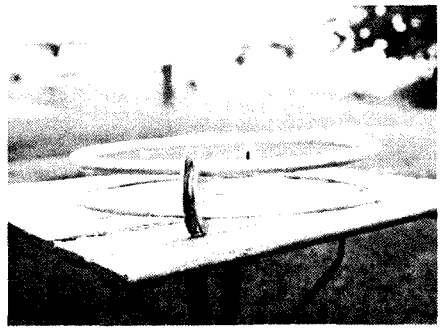


Rings and Capacitor Plates.

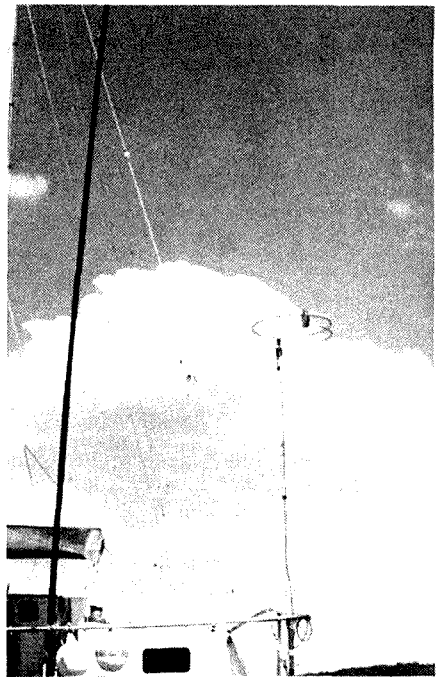
63.5mm (2.5") centre-to-centre and holes drilled through the capacitor plates to accommodate the 20 and 8mm tubes (see photograph). At this time five additional holes were drilled in the plates so that nylon nuts and bolts could be used to adjust the distance between the plates. Blocks were then taped between the plates to enable welding of the plates to the tubes by the local plumber for the princely sum of a "six-pack". The total cost of the antenna was $18.

All that remained to be done was to cut the small tubing for a feed-point and provide an antenna mount. The mounting block was constructed from a nylon cutting-board (also found at the tip). This block was cut to approximately 127 x 63.5 x 12.7mm (5 x 2.5 x .5"). The smaller ring was then cut to provide a 12.7mm (.5") gap opposite the capacitor plates. The ends were flattened, and drilled to accommodate mounting them on the nylon block and for the direct connection of the 50 ohm coaxial cable. The larger ring was drilled and similarly mounted to the block.

The remaining block area was used to attach the antenna to a mounting pole of larger tubing. This particular halo is mounted some three metres above sea level on the writer's catamaran and has proved its worth over a vertical antenna when working stations using horizontally polarised beams.



Capacitor Plates and Rings ready for welding. A matchbox, placed on its end, provided almost perfect spacing.



The six metre Halo mounted on ***WINDROSE*** and situated about 3m (10 feet) above the water.

Recently, during a voyage from Weipa to Thursday Island tests were carried out with Arthur VK4IR and Col VK4ACG, in Weipa and also Brian VK4ZTI, at Thursday Island. The contacts ranged from about 40km to 60km with good signals both ways. It should also be noted that I was running 2.5 watts whilst Arthur and Col were using 10 watts with two element beams — no preamplifiers.

From Jackson River, contact was possible with Brian, who was operating portable on Thursday Island with a whip on its side. Even from the north-west tip of Cape York VK4IR was Q3 and VK4ZTI was Q5. Not bad for a mobile antenna!

AR

QSP

THE TRIAL IS OVER

The trial for Jack Ravenscroft VE3SR, is over. Testimony was presented in January and observers felt the trial went well.

Jack, from Ottawa, was sued for $35 000 for allegedly interfering with a neighbour's microwave oven, furnace control and home entertainment equipment. During the trial, Canada Radio Relay League (CRRL) Director, Ray Perrin VE3FN, testified that Jack could not be held responsible for the interference. He compared the problem to rain entering a hole in the roof. There will always be rain. You have to fix the roof. The analogy was appropriate.

DOC personnel, who indicated that Jack's station was essentially clean and that Jack had been operating within the law, testified that even their own hand-held transceivers created problems for the plaintiffs' equipment.

The plaintiffs then produced a tape recording of a CW transmission copied on their home entertainment equipment. To their embarrassment it was not transmitted by Jack, but was a transmission by another amateur operating a block and one-half away!

From CRRL News

VHF ANTENNA TUNER

K England VK4TPE
31 Morgan Street, Rockhampton, Qld. 4700

Ever had your solid state VHF rig close down its finals because of an impedance mis-match at the antenna? Many amateurs use antenna tuners or transmatches on HF, but few use such devices on VHF.

A design for an antenna tuning unit (ATU) suitable for the 144MHz band was published in the British publication *HAM RADIO TODAY*, December 1983. Graham Packer G3UUS, in his article entitled *Wire Antennas on 2m — A practical Proposition?* suggests their use with G5RVs and wire antennas, including Rhombics, long wires and multi-wavelength loops, as well as the more conventional Yagi type antennas.

A tuner constructed by the writer for a little under $30 has matched a long wire, a half wave on 27MHz and two metre verticals. With some modification, it has also enabled matching of the wire and 27MHz antennas to 50 ohm feed impedance, at 52 and 53MHz.

Construction is simple and can be modified by the constructor for his/her particular needs and source of parts. The original design had a half-wave length of coaxial cable placed inside the box as a balun, but this can be placed externally as desired.

Some difficulty may be encountered in obtaining suitable air-gap capacitors. It is possible to reduce higher value capacitors by removing plates to obtain the correct value. Should larger capacitor values be used, the tuning will be sharper and will result in practical difficulties in obtaining and maintaining a correct match, even on smaller changes of frequency change.

The following parts are required:

One metal die-cast box — 150 x 80 x 50mm
Four SO239 or BNC sockets (consider Type N — Tech Ed)
Two insulated binding posts
Two PL259 or BNC plugs (consider Type N — Tech Ed)
600mm RG58U
Quantity of No 16 B & S enamelled copper wire (1.25mm diameter)
Two air-gap 30pF variable capacitors
Two knobs, screws, solder lugs, nuts, bolts, washers and pop-rivets

CONSTRUCTION — refer diagram

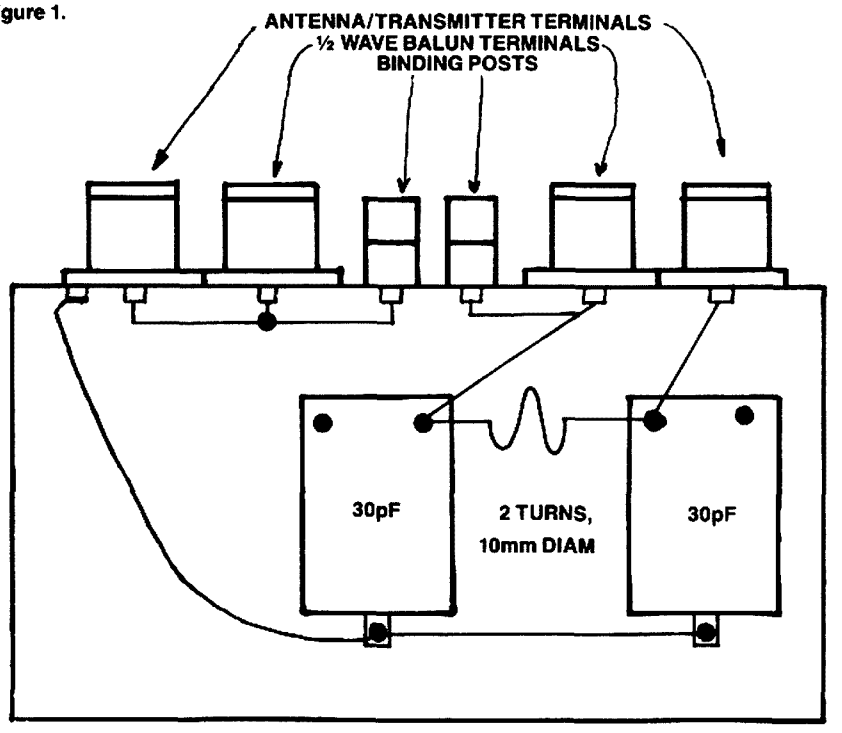
Mount all four sockets along one side of the box leaving about 15mm (0.6") between the second and third sockets for the two binding posts.

Pop rivets were used to attach the panel mounting sockets to the box on three of the four holes. The remaining hole used a nut, spring washer and bolt to securely ground the solder lug. Install the two binding posts between the sockets. Next, position and mount the two capacitors in such a way as to obtain the shortest practical length for the wire connections. The coil is placed between the capacitors consisting of two turns of B & S 16, 10mm in diameter spaced 5mm apart. Make up the balun using 600mm of RG58U.

The described version of the tuner used the lid as the base with the capacitor shafts towards the top. This is not critical and is dictated by the shape and size of the capacitors (the use of the box for continuous grounding for sockets and capacitors would be beneficial to reduce inductance paths — Tech Ed). Some expense in plugs and sockets could be spared if the balun were inside the box, however, it does make for a handy patch cable when the ATU is not in use. Make sure all solder connections are really sound and care is exercised so that solder does not encroach onto the capacitor plates.

A six metre version of this tuner required approximately 70pF capacitors and an inductor of eight turns 10mm in diameter. This version was not tested to finality owing to transmitter problems and as such, the values given may require some experimentation.

Figure 1.



OPERATION

Initially, whilst you are getting the feel of things, reduce the transmitter output to the minimum necessary to obtain SWR meter calibration, *and connect a suitable dummy load.* Set both capacitors half in mesh. The capacitor settings are very interdependent and are varied in convention to tuning a HF version. Small changes in each will provide overall improvement until a perfect match is obtained. At this point, increase transmitter power to normal and re-adjust as required. (SWR meter diodes linearity typically cause this effect — Tech Ed).

After getting the feel of the tuner, connect your antenna and repeat as above. Open line feed balanced and unbalanced may be connected utilising the binding posts.

Small capacitors have been found adequate for two metres with 25 watts, but with higher powers larger capacitors will be necessary.

CONCLUSION

Whilst this ATU may not tune the *bed-springs* or the *back-fence*, it may allow the television antenna to serve another purpose.

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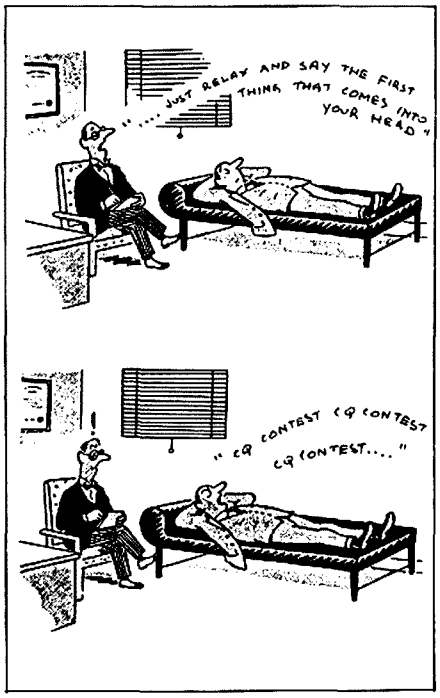


Original cartoon from PUNCH magazine — adapted and contributed by Ivan Huser VK5QV.

VOLTAGE FED LOOP ANTENNAS

David Robertson VK5RN
10 Milan Terrace, Stirling, SA. 5152

Such antennas have two feed points, both of which must receive the same power. Therefore, the impedance of the two feed points must be matched to the characteristic impedance of the delay line. This is so, whether the driven element is a loop or crossed dipoles. Circular polarisation can be generated by spacing the vertical and horizontal elements along the boom. A spacing of a quarter of a wavelength produces a 90 degree phase difference between the vertical and horizontal field components. A delay line is then not required and accurate matching is less critical. However, it is still necessary to ensure equal power flows to the two feed points so that the two feed point impedances must still be equal to one another.

The Quadraquad, as first described, was difficult to match to the delay line. Since then, I have developed a new feed system that is easy to make. It is a voltage fed system that is analogous to an end fed half-wave dipole. Many of us have used such antennas, particularly in portable work, and the usual way of feeding them is by means of a parallel tuned circuit with the antenna attached to the *hot* end and the coaxial cable tapped a turn or two up from the *cold* end of the coil.

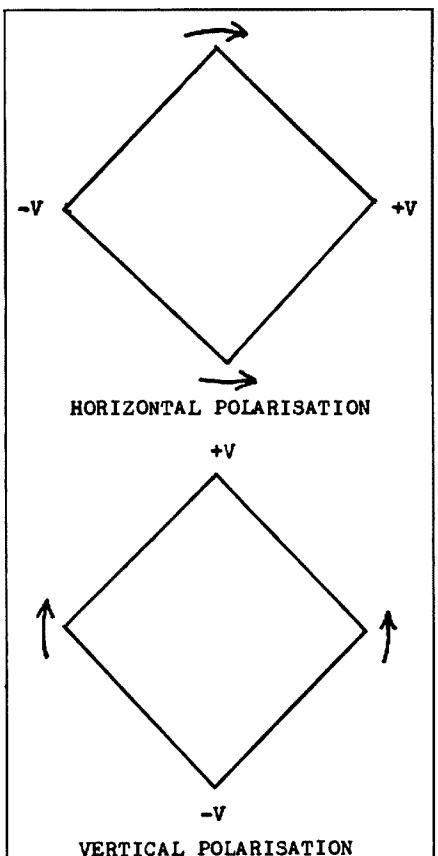


Figure 1 — Voltage and current distributions on a one wavelength quad loop. Current maxima are denoted by arrows and voltage maxima by +V and —V. The voltage and current maxima are separated by a time interval of a quarter of a period.

Figure 1 shows voltage and current distributions for a diamond configuration, one wavelength, quad loop. The universal way of feeding such a loop is to split it at a current maximum and then to feed current into the terminals. However, there is another way of doing this.

Voltage maxima occur at two points around the loop so that voltage feed can also be used without having to split the loop. Simply treat the loop as if it were a voltage fed long wire, as shown in Figure 2. At VHF and UHF use a quarter-wave coaxial transformer instead of a parallel tuned circuit.

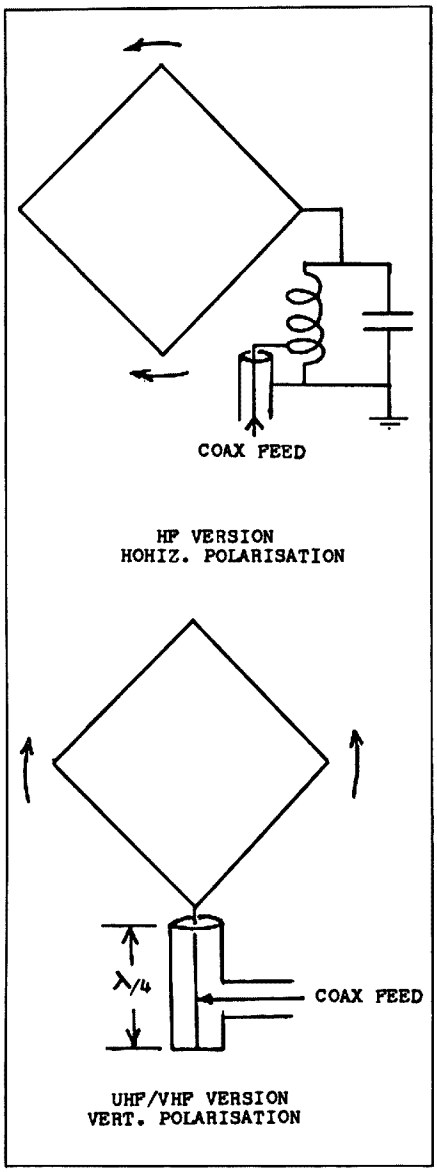


Figure 2 — Two methods of voltage feeding a one wavelength quad loop.

Quarter-wave transformers are easy to make. Use a length of copper or brass tubing for the outer, and some rigid wire or a rod for the inner. Diameters are not critical. For the outer I use 30mm (1.26") diameter tubing at VHF and 19mm (.75") diameter tubing at UHF. For the inner I use 10 gauge copper wire. Slot the outer for about half of its length with a hacksaw. Make the slot wide enough to insert the tip of a soldering iron so that the coaxial feeder can be soldered in place when the correct tapping point is found. Now solder a piece of sheet brass across the slotted end of the outer for a short circuit. Drill a hole for the inner in the centre of the shorting plate and push the end of the inner into the hole and solder it in place. The finished article is shown In Figure 3. The transformer is clamped to the cross arm of the quad and the inner is soldered to the corner of the quad so that it is now supported at both ends. No other support for the inner should be necessary, although I do use one insulating washer with appropriate drain holes in my VHF antenna transformers.

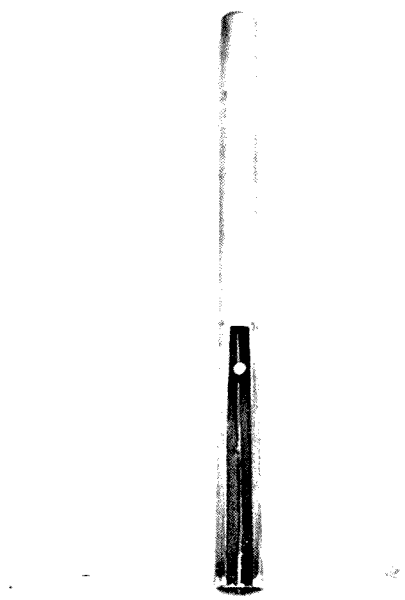


Figure 3 — A 145MHz ¼ Wave Transformer.

Matching the antenna to the feeder is now easy. To achieve matching, you always need two variables to adjust. In this case, one variable is the tapping point position. The inner of the feeder is slid up and down and is soldered to the inner of the transformer when the correct position has been found. The other variable, so far unmentioned, is top capacity loading. Make the quarter-wave transformer five percent shorter than an electrical quarter-wavelength so that some top capacitance is necessary to resonate it. The top capacitance consists of a piece of rigid wire or strip soldered to the transformer inner at its open end where it is also connected to the corner of the quad. Only one end of the strip is attached to the inner, the other end floats electrically free and its length is adjusted with a pair of side-cutters or tin snips. Put the VSWR bridge as close to the feed point as you can when making these adjustments. I insert the bridge into the feeder just behind the reflector.

By adjusting the tapping point and the capacitive loading in turn a perfect match can

The use if loop antennas for the generation of circularly polarised waves was described by Underhill, in 1976[1]. His loop was one and a third wave-lengths long. I re-invented the wheel in the form of the Quadraquad, in 1984[2]. The Quadraquad was based on a standard one wave-length loop.

be achieved in a few minutes. I invariably cut too much off the capacitor at first and have to replace it, but that is easy enough to accomplish. Make sure that the slot and the open end of the transformer slope down so that water will run out. I find that water runs straight through the transformer, without affecting it greatly, although there is a slight change in VSWR when it rains. This could be the result of water on the fibreglass cross arms.

In the diamond configuration of Figure 1, voltage-feeding of either side produces current maxima at the top and bottom and hence horizontal polarisation. Voltage-feeding either the top or bottom produces vertical polarisation. Feeding both the bottom and one side in quadrature produces circular polarisation provided that the two feed points receive the same power. When this double feed is used for circular polarisation, each feed point must be matched carefully to the characteristic impedance of the delay line in order to ensure equal power division. The two feed points are entirely independent so that it is not necessary to work back and forth from one to the other. Exactly the same procedure must be followed with crossed dipoles if you want to finish with reasonable circularity.

Most of us own VSWR bridges which are designed for 50 ohm coaxial line, so we are stuck with 50 ohms for the delay line. Thus, the main feeder sees 25 ohms at the tee junction with the delay line. So, there will be a VSWR of two on the main 50 ohm feeder.

You can either tolerate this, or you can make a 35 ohm quarter-wave coaxial transformer to remove it. I tolerated it with my VHF antenna, which is only used for receiving and boasts a mast head preamplifier. My UHF antenna has a home-made transformer with a characteristic impedance of 35 ohms. These complications in matching the main feeder are common to crossed dipoles where you meet exactly the same problems. Of course, in both cases, a 75 ohm VSWR bridge would make the game easy. A 75 ohm delay line, giving 37 ohms at the junction would be close enough to a match for a 50 ohm main feeder.

Figure 4 shows the business end of my UHF antenna. The two quarter-wave transformers are clamped to the cross arms and the 35 ohm matching transformer is strapped to the boom. There may seem to be a lot of ironmongery in the field of the driven element, but none of it is resonant at the operating frequency and it appears to have no effect on performance. The 35 ohm matching transformer consists of 16mm (⅝") internal diameter copper tubing for the outer and a piece of RG8 coaxial cable for the inner. The outer braid of the RG8 serves as the inner as its diameter is about 10mm (⅜"). The advantage of a voltage fed loop over a dipole is that it is an unbalanced system so that no baluns are necessary. You still have to adjust two parameters to match a dipole driven element. Of course, you can use a gamma match with a dipole, to avoid the balun, but they have a habit of unbalancing the beam and, even then, you have to adjust two parameters just the same. It is very easy to match a feeder to the voltage fed loop if you are only interested in a single feed point and linear polarisation. A few minutes of adjusting with the top capacitance loading and the tapping point will reward you with a near perfect match.

I, like many others, have found that whilst loops make excellent driven elements and

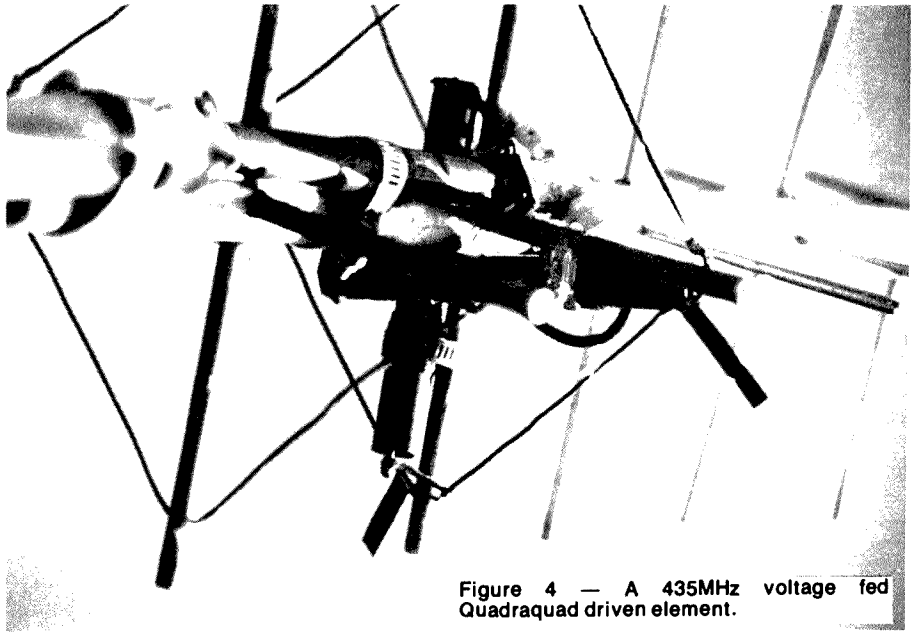


Figure 4 — A 435MHz voltage fed Quadraquad driven element.

reflectors, they do not work very well as directors. This is said to be because the mutual reactance between loops is of the wrong sign for directors. The best idea is to use loops where they work best — as reflectors and driven elements, and to use normal Yagi directors. I call such antennas **Quadraquagis** if they are circularly polarised, otherwise they are, of course, know as Quagis.

The quarter-wave transformer has another advantage — as well as being a matching device, it is a filter, so that out-of-band interference is reduced. I find that my Yagi antenna on 145MHz is much more prone to interference from nearby television transmitters than is the Quadraguagi with its quarter-wave transformers. Of course, they are poor filters, but nevertheless they do reduce out-of-band signals which can overload receiver front ends.

I discovered a trick with delay lines. A quarter-wavelength in one arm and a half-wavelength in the other arm is perfectly in order, but it pays to use odd eighth wavelengths, such as one-eighth and three-eighths. There is a reason for this. If the two feed point impedances are resistive and equal, the power will divide equally even if the feed point resistance does not match the characteristic impedance of the delay line. This only happens for odd eighth wavelengths. This can be proved as follows:

The input impedance Z_1, of an eighth wavelength of transmission line of characteristic impedance Z_o, terminated by a resistance of R_t is given by —

$$Z_1 = Z_o [(R_T + jZ_o) / (Z_o + jR_T)] \text{ where } j = \sqrt{-1}$$

The input impedance, Z_2, of a three eighths wavelength of the same line terminated by the same resistance is —

$$Z_2 = Z_o [(R_T - jZ_o) / (Z_o - jR_T)]$$

Z_1 and Z_2 are the same, except that the imaginary parts are of opposite signs. Such quantities are known as complex conjugates. The impedances have equal and opposite reactances, one capacitive and one inducative. When Z_1 us connected in parallel with Z_2 at the tee junction with the main feeder the two equal and opposite reactances cancel out and the resulting impedance is purely resistive. It is given by —

$$Z_3 = (Z_o^2 + R_T^2) / 4R_T$$

So, the power divides equally because Z_1 and Z_2 have the same absolute values and, in addition, the impedance Z_3 seen by the main feeder is purely resistive. There is no particular virtue in having this purely resistive impedance at the junction unless it happens to match the characteristic impedance of the main feeder. It is the equality of power division that matters. This only happens if the two feed point impedances are equal and resistive.

This is likely to be approximately the case if the antenna is resonant, or nearly so. In any case, this property of eighth wavelength transmission lines is well worth using. I have used the idea in my UHF antenna, but not in my VHF antenna. I had not thought of the idea when I built my 145MHz antenna, which uses a quarter and half wavelength.

One final word of warning — the easiest way to get confused is to solder pieces of coaxial cable together to make junctions at UHF I tried this at first to avoid the high cost of N connectors, particularly tee junctions. I wasted much time getting confusing VSWR results. Finally, I bought the necessary N connectors, including a tee junction and it was then plain sailing.

I have a crude, but effective way of estimating the equality of power-division between feeds. *Dare I say it?* I use a neon bulb! I feed about 50 or 100 watts to the antenna and move the bulb around the loop. When driven in the circular mode, loops have an unusual property. The voltage is constant at all points on the loop

so that there should be little variation in intensity as the bulb is moved around it, see appendix. For low power testing, use a field strength meter instead of a neon bulb.

References

1 The ip quad — a new versatile quad driven element. M J Underhill. Radio Communication September 1976, p664.
2 The Quadraquad — Circular polarisation the easy way. D S Robertson VK5RN. QST April 1984, p17.

Appendix

In Figure 5, V_1 and V_2, the two feed point voltages are of equal amplitude, but 90 degrees, or $\pi/2$ radians apart in phase.

Let V_o = peak voltage, then,

$V_1 = V_o \text{Sin}\omega t$

$V_2 = V_o \text{Sin}(\omega t + \pi/2) = V_o \text{Cos}\omega t$

At any point, P, a distance 1 around the loop from feed point 1.

$V_1 = V_o \text{Sin}\omega t.\ \text{Cos}(2\pi l/\lambda)$

$V_2 = V_o \text{Cos}\omega t.\ \text{Cos}[2\pi(l - \lambda/4)/\lambda]$

$= V_o \text{Cos}\omega t.\ \text{Sin}(2\pi l/\lambda)$

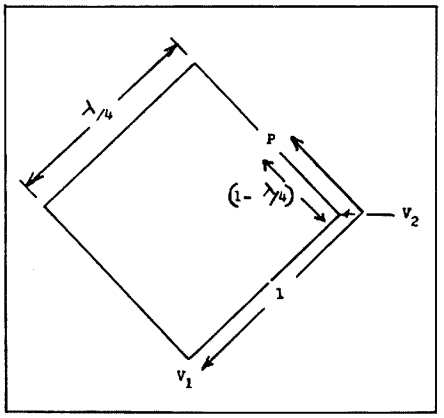


Figure 5 — Diagram for the calculation of the voltage distribution on a one wavelength Quadraquad loop. λ is the wavelength.

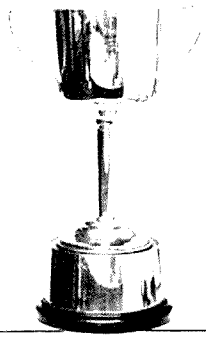
The resultant voltage, V at P is the sum of V_1 and V_2.

$V = V_o \text{Sin}\omega t.\ \text{Cos}(2\pi l/\lambda) + \text{Cos}\omega t.\ \text{Sin}(2\pi l/\lambda)$ or

$V = V_o \text{Sin}(\omega t + 2\pi l/\lambda)$

This is the equation for a travelling wave of constant amplitude V_o. The phase of the voltage varies with 1, the distance around the loop, but there is no variation in amplitude. A dipole supports a standing wave. There are voltage maxima at the ends and a current maximum in the middle. The Quadraquad supports a travelling wave. The wave travels around the loop so that the peak voltage and current are constant. It shares this property with terminated long wire antennas. The unusual feature of the Quadraquad is that it supports this travelling wave without requiring a terminating resistor.

AR



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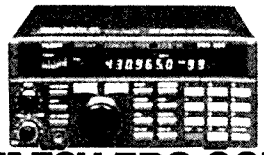

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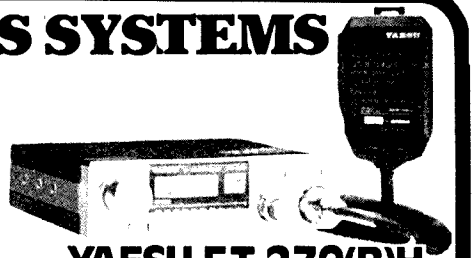

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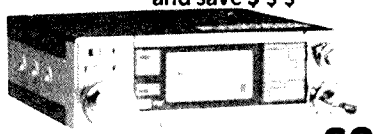

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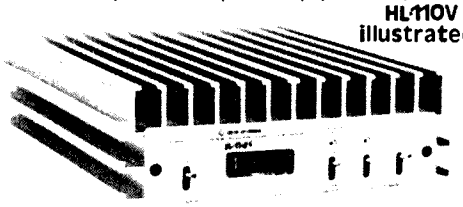

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DUAL LED LEVEL INDICATORS FOR USE IN RTTY TUNING AND OTHER FUNCTIONS

Peter Gibson VK3AZL
9 Coombah Court,
Mooroolbark, Vic. 3138

This article describes a dual level indicator using LED bars as the output displays. Although originally built to be used as a RTTY tuning indicator, it can be put to many other uses as described later.

INTRODUCTION

Some time ago, I decided that I would like to be able to decode the RTTY signals, both commercial and amateur, that I could hear across the HF bands.

Since I did not own a usable micro-computer at the time, which seems to be the normal approach, but I did have a terminal (VDU), I built a totally hardware-based system. It was designed to be extremely flexible, being able to accept almost any shift and any known Baud rate in either Baudot or ASCII. The output of the box was 1200 Baud ASCII which the terminal would accept and display on the screen.

The whole project became an interesting, if not somewhat, drawn-out technical exercise of limited use since I now find that a large number of those signals do not conform to any of the common signal formats, or appear to be encrypted and therefore only print garbage.

However, whilst developing the decoder, I had reason to develop some peripheral items of equipment which have turned out to be more interesting, or useful, than the original project. The unit described here is one of them.

Anyone who has tried receiving RTTY signals on a tunable receiver quickly finds that some form of tuning aid is indispensable. My decoder incorporated buffered outputs from the tone filters to drive the X and Y inputs of an oscilloscope, so giving the familiar cross shaped display. I consider that this form of display is possibly the simplest, and most versatile display available since not only does it show correct tuning, but it can also show such things as multi-path, selective fading and presence of other tones. Many of these characteristics can cause either errors or complete lack of proper decoder operation.

After using the oscilloscope for some time I decided that I needed a simple, self-contained display that could be used to accurately tune the receiver and therefore free the oscilloscope for other work. Initially, it was thought that a solid-state version of the oscilloscope screen, using a LED matrix would make an interesting project. It very quickly became apparent that whilst being interesting, it would probably not be self-contained and definitely would not be simple or cheap. Finally, reason prevailed and I settled on a simple peak detector driving a LED bar-graph display for both mark and space channels to give desired results.

DESCRIPTION OF CIRCUIT

The circuit consists of two channels, one for the mark tone and one for the space tone. Each channel consists of a precision half wave peak detector using one half of a dual operational amplifier (uA/LM747) driving an LM3914 bar display driver which, in turn, drives a 10 LED bar display (or as described later, 2 x 10 LED bar displays.). Figure 1 shows the complete circuit.

Since both channels are identical, only the operation of one channel will be described in detail. The component identification in the description will relate to the channel called the *MARK* channel.

PEAK DETECTOR

The precision half wave peak detector uses an operational amplifier and other components, in addition to the normal expected diode. The advantages offered by this additional complexity is the improved detector linearity and the effective elimination of the detector threshold effect caused by the diode forward voltage drop.

In more detail, the operation of the peak detector is as follows:

The input signal to the detector is AC coupled through C1 and R1 to the inverting input of the operational amplifier (half of uA/LM747). The output of the circuit can be defined as the point from which the feedback resistor (R_2) is driven, in this case, the junction of R_2, C_2 and D_2. The closed loop gain (ie the gain from the input of the circuit to the output) is defined as the ratio of R_2 to R_1.

ie $A_v = -R_2/R_1$ (for the inverting input

In this case, R_2 equals R_1 so the closed loop gain is —1. Because diode D_2 is within the feedback loop, its forward voltage drop (when conducting) can be considered to be divided by the operational amplifier open loop gain. Here the open loop gain is in excess of 100 000 at low frequencies so the diode forward voltage drop can be considered to be effectively zero. Therefore, in this circuit, the diode still operates as a diode, albeit a perfect diode with essentially no forward voltage drop.

On the negative cycle of the input wave-form capacitor C_2 is charged to a positive voltage equal to the peak of the negative signal. As the input signal then goes positive, diode D_2 turns off, isolating C_2. The discharge time of C_2 is determined by the value of VR1 in parallel with R_2. The time constant of the R, C_2 combination is long compared to the audio frequencies involved but short compared to the length of the mark signal so that the output voltage reflects the presence or absence of the mark signal.

Diode D1 is included in the circuit to provide an alternate feedback path around the amplifier on the positive half cycle of the input signal when diode D_2 is turned off. If no feedback path is provided, the amplifier is operating open loop and could either permanently latch up or at least be a little slow to recover on the next negative cycle.

The input impedance of this circuit is defined as the value of R_1 and obviously stays constant throughout the entire input cycle. In this case, R_1 is 10 kΩ. It is possible to raise this up to 100 kΩ if increased input impedance is required. Just remember to change R_2 as well to maintain the correct ratio. It is also possible to alter the ratio of R_2/R_1 which will give the detector gain, ie if R_2/R_1 = 10, then the output will be 10 volts for one volt of peak audio input.

DISPLAY DRIVER

The LM3914 is one of a family of integrated circuits which senses an analogue voltage and drives an array of at least 10 LEDs with a particular relationship between the input signal and display. In the case of the LM3914, the relationship is a linear one. The device can be made to display either a single moving dot or a complete bar-graph, by connecting the *MODE* pin (pin 9), either to supply or leaving it open circuit.

The integrated circuit contains its own internal adjustable reference and an accurate

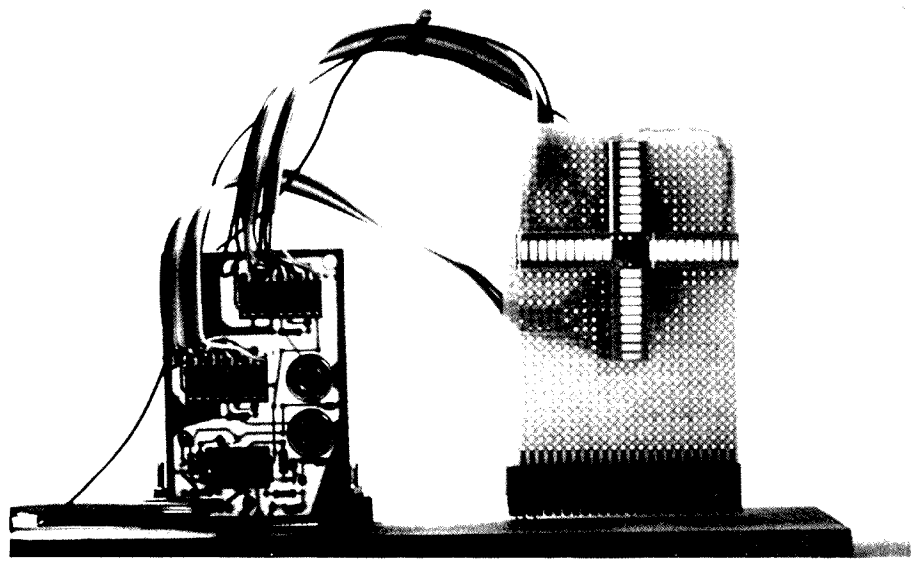


Figure 1.

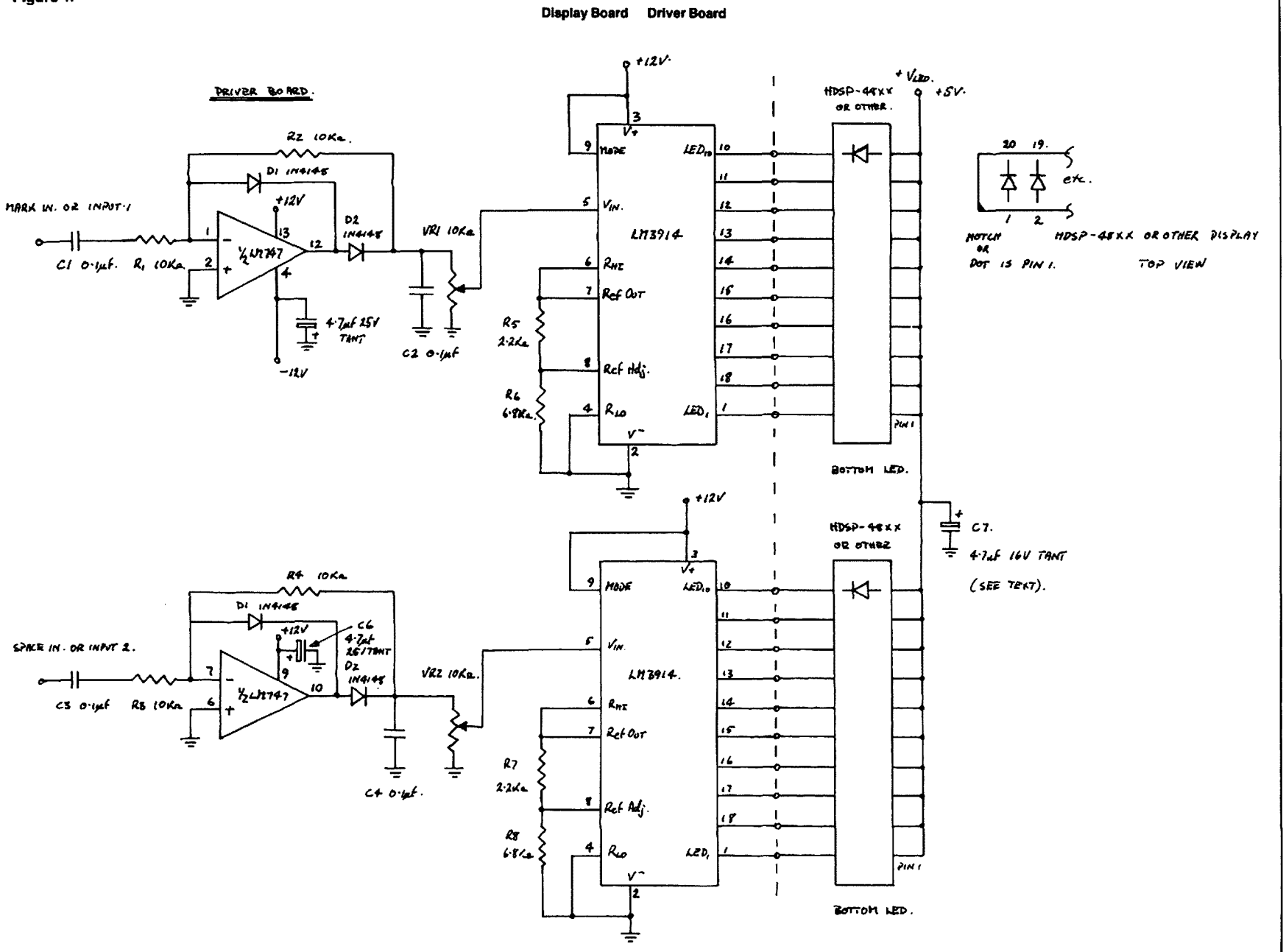
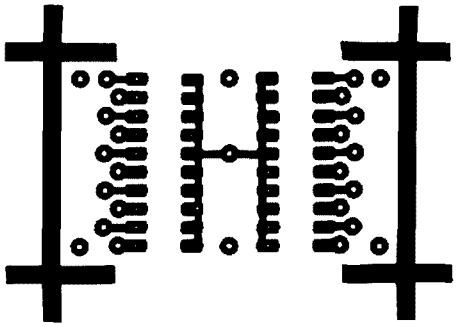
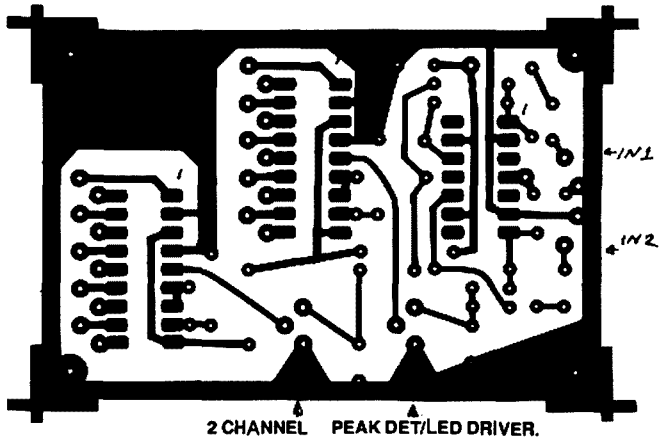

Display Board
Driver Board
DRIVER BOARD.
R2 10Ka.
D1 IN4148
+12V
MARK IN. OR INPUT 1
C1 0·1µF.
R1 10Ka.
½ LM747
D2 IN4148
VR1 10Ka
4·7µF 25V TANT
-12V
C2 0·1µF
LM3914
R5 2·2Ka
R6 6·8Ka.
Ref Out
Ref Adj.
+VLED.
+5V.
HDSP-48XX OR OTHER.
BOTTOM LED.
PIN 1
20 19.
etc.
1 2
NOTCH OR DOT IS PIN 1.
HDSP-48XX OR OTHER DISPLAY
TOP VIEW
C7.
4·7µF 16V TANT
(SEE TEXT).
R4 10Ka
D1 IN4148
C6 4·7µF 25V TANT
SPACE IN. OR INPUT 2.
C3 0·1µF
R3 10Ka
D2 IN4148
VR2 10Ka.
C4 0·1µF.
R7 2·2Ka
R8 6·8Ka

Figure 2 (both channels)



Dual 10 Segment LED Displays.



2 CHANNEL PEAK DET/LED DRIVER.

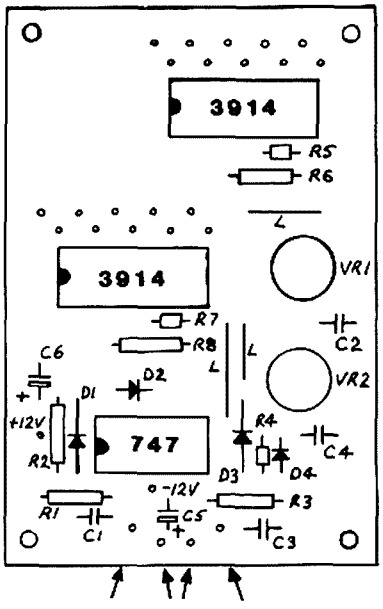


Figure 3 — Dual 10 LED Bar-graph Component-Side Layout.

10 step voltage divider. If the reference voltage is connected to the "high" end of the voltage divider whilst the other end is grounded, the circuit will light none of the LEDs in the bar when the input voltage is zero and all of the LEDs when the input is equal to, or greater than the reference voltage.

The reference voltage may be adjusted by varying the ratio of resistors R_5 and R_6. This relationship is described by the equation:

$$V_{REF} = 1.25(1 + R6/R5)$$

In addition to adjustment of V_{REF}, the current drive to each of the LEDs in the bar may be adjusted by varying R_5 in the relationship.

$$I_{LED} = (12.5/R5)\ mA \quad (R_5 \text{ in } k\Omega)$$

Therefore, it can be seen that the LED current must be defined first so that a value for R_5 can be set. A suitable value for R_6 can then be found by setting V_{REF} equal to the maximum input voltage required.

The current drawn by the LEDs must be a compromise between adequate brightness and reasonable current consumption. The figure chosen for this circuit is about 5mA.

Therefore if:

$$I_{LED} = 12.5/R5$$

$$R_5 = (12.5/I_{LED})\ k\Omega$$

$$R_5 = 12.5/5 = 2.5\ k\Omega$$

A close preferred value for R_5 is 2.2 kΩ which gives I_{LED} equal to 5.7mA.

Since the audio voltage level available from the tone filters in the RTTY demodulator was relatively high, the voltage level for the maximum height display was set to about five volts.

If $V_{REF} = 1.25\ (1 + R6/R5)$

$R_6 = R_5\ (V_{REF}/1.25 - 1)$

If $V_{REF} = 5.0$ volts and

$R_6 = 2.2\ k\Omega$

$R_6 = 2.2\ (5.0/1.25 - 1)\ k\Omega$

$= 6.6\ k\Omega.$

The nearest preferred value is 6.8 kΩ. This gives a V_{REF} of 5.11 volts. The precise value of V_{REF} is not important in this case because only a relative indication is required and VR1 can be used to trim the input voltage to match the actual V_{REF}.

LED DISPLAYS

The HDSP-48XX displays produced by Hewlett-Packard were used in my unit. They are not too difficult to get and are available in a wide selection of colours. The full part numbers, plus some alternatives are described in more detail in a later section.

This form of display device is not absolutely necessary, but does give a very compact, neat-looking display. A display made up of individual LEDS can be used if they are cheaper, or easier to use.

VOLTAGES

The supply voltages used are ± 12 volts for the main board and +5 volts for the LED supply. These values were dictated by their availability from the decoder unit.

The supply voltages for the LM747 and LM3914s are not critical and may be anywhere from ± 9V to ± 15V.

The supply voltage for the LEDs should be as low as possible. They could use the same supply as the LM3914, but when this is around +12V, the IC package can get very hot with all LEDs turned on. This occurs because the LM3914 drives each LED with a fixed current, independently of the supply voltage. The voltage difference between the supply and the forward voltage across the LED therefore appears across the driver circuitry. Ohm's Law says that the power dissipation can mount up rapidly with up to 10 LEDs being driven. A supply voltage of +5V for the LEDs is usually available if logic is used and results in a cool-running IC. The precise voltage is not really critical.

CONSTRUCTION

The circuit construction is quite straight forward. I have used a printed circuit board for the detectors and display drivers and a separate aboard for the two displays. Figure 2 shows the full-size copper side layout for both boards. The two boards are connected together by two 10 wire ribbon cables. This approach allows the displays to be mounted behind the front panel in the minimum space possible whilst the other circuitry may be mounted *in any convenient* location.

Figure 3 shows the component layout on the main printed board. One thing to note about the layout is that some resistors and diodes are mounted flat on the board, whilst others are mounted vertically where room did not permit otherwise. The lines with the letter **L** beside them are wire links. The display printed board is simple and no layout is really possible apart from deciding which end is top or bottom.

One important component which is shown on the circuit but is not allowed for on either board is C7. The circuit will work (or appear to) without this capacitor. However, when tuning across the band with this circuit being driven by the receiver output, you may suffer from rather odd QRM. This is caused by the LM3914 oscillating on peaks when driven. These oscillations are quite wide band! In theory, this capacitor should go from the positive supply side of the LEDs back to the LM3914 ground (pin 2). In practice, this is not usually possible, so I have wired directly from the supply terminal on the display board to the nearest ground point. This seems quite effective in stopping the oscillations.

While building a second unit, it occurred that it would be interesting to extend the display to a cruciform shape to see if it offered any advantages. It is very easy to do by arranging a cross pattern of four displays and wiring the opposing LEDs in series. The modified display circuit is shown in Figure 4. Because the LEDs are in series, there is no more current drawn from the supply. Under these conditions, the LED supply voltage can be higher than for single LEDs. Figure 5 shows the prototype cross display and the driver board.

The advantages of this form of display are that the LM3915 runs a little cooler under full load because of the series LEDs and that it looks quite good — especially if the two bars are different colours. The disadvantages are that it costs more and takes up more space. Another use for this form of the display was suggested when the other members of the family saw it running on the bench, although I really think that a multi-coloured, animated star on top of next years Christmas tree is going just a little bit far.

TESTING

After both boards have been wired and

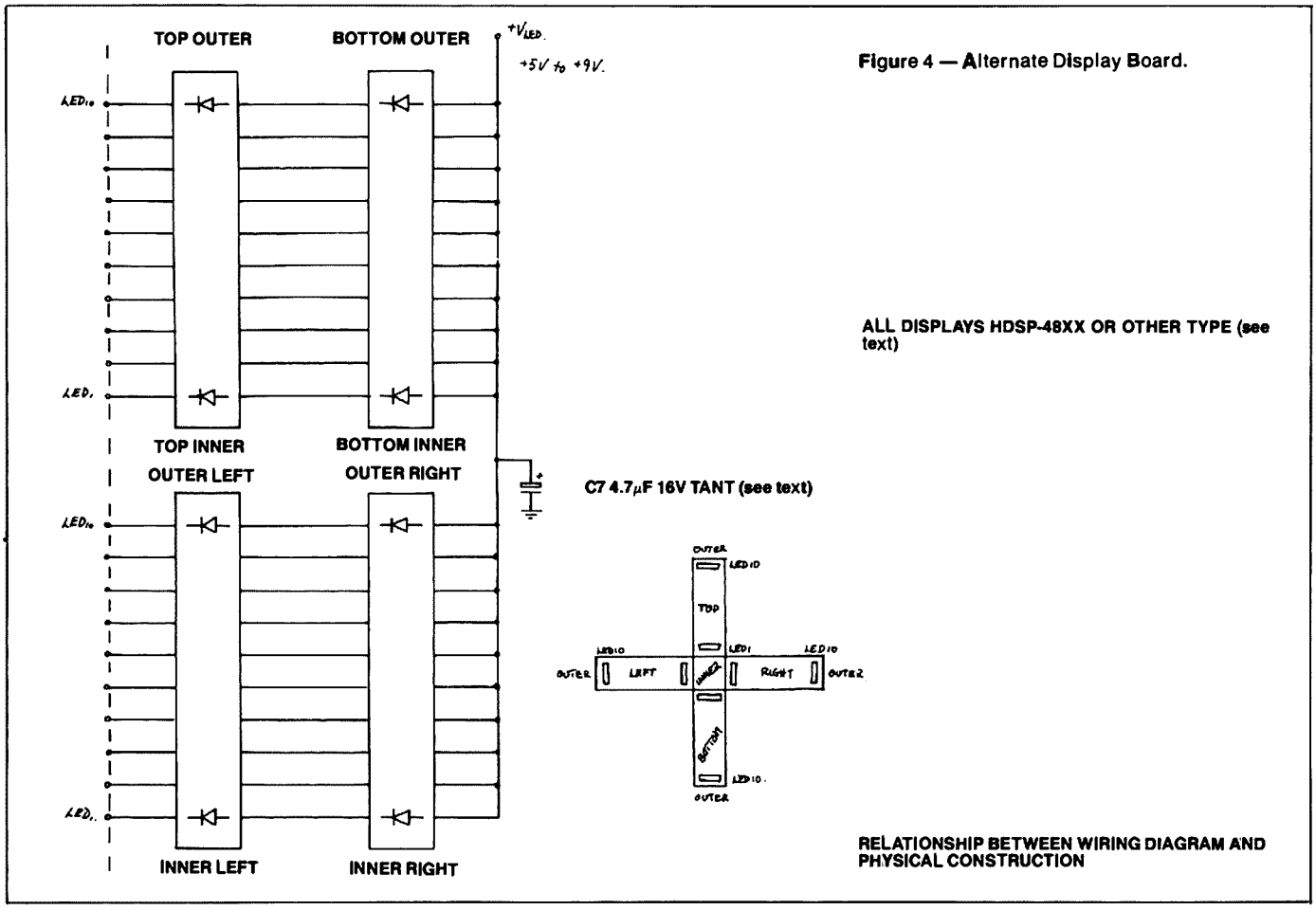


Figure 4 — Alternate Display Board.

connected with the ribbon cables, it is a good idea to look for missing links, in soldered joints and swapped ribbon wires. If all looks correct, apply power.

With power applied and VR1 and VR2 at maximum settings, apply a variable amplitude audio source to each input in turn. Slowly increase the signal level from zero and watch the LED bar switch on in even steps. If any LED lights out of sequence it means that the interconnecting cables are not wired correctly. After this test, set the audio source to the maximum level required and adjust VR1 or VR2 until the top LED just turns on.

This completes testing and the unit is now ready for use.

COMPONENT AVAILABILITY

Most of the components used in this circuit are readily available (at least in Melbourne), with the LED bars possibly being the hardest to find.

If you are in the position to do so it is a good idea to shop around. I found, when buying the LM3914s, that the price varied by almost 100 percent between different dealers that I frequent.

The Hewlett-Packard displays are available from VSI Electronics (Australia) Pty Ltd, who have offices in a number of cities. They have a minimum order of $20 but buying four of these displays will be just over this, so that should be no problem. I have used the HDSP-4830 (Hi-Efficiency Red) and HDSP-4840 (Yellow). There is also the HDSP-4850 (Hi-Efficiency Green) and HDSP-4832 or 4836 (Multi-Colour) for those who want all three colours in one display.

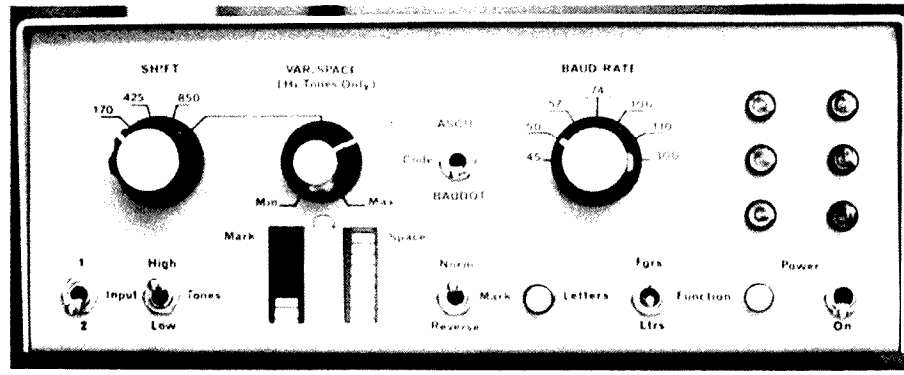
The MV57164 LED bar is manufactured by General Instruments and was brought in Melbourne some time ago. I do not know if it is still available.

Another possible supplier of LED arrays is Radio Spares Components who have outlets in a number of cities also. The relevant description in their recent catalogue is a *"10 bar DIL array"* and is available in red and green. I have not tried them, but the picture in the catalogue appears similar to the MV57164.

OTHER USES

Although the circuit described here was built for one purpose, it can, of course, be used for many other requirements where one or two level indications are needed. The type of peak detector used allows low level signals to be measured without the normal diode threshold effect and it can be built with gain also. If the peak detector is bypassed, the LM3914 can be used as a straight level meter. I have used a similar circuit for an S-meter in a receiver.

As stated previously, the LM3914 is only one of a family of display drivers that are available. The LM3914 exhibits a linear relationship between input and the display described before. The LM3915 exhibits a logarithmic relationship between input voltage and the display, with each LED representing a 3dB increase in level. The LM3916 exhibits a similar logarithmic response modified to give a VU characteristic. Therefore, the LM3914 and LM3916 are more suitable for use where indication of wide level variations is required, such as for audio or speech level indicators. The information given in the National Data book is quite detailed with many possible applications described. The printed board and display described here should work with any of the other devices. **AR**



This is not a heresy on established matching principles but rather a re-arrangement of the facts to allow a VFO to cover the band.

Bill McLeod VK3MI
42 Capon Street, Chadstone, Vic. 3198

MIS-MATCHING FOR EXTENDED BANDWIDTH

The finicky transmitter that requires no greater than a 2:1 VSWR from its nominal 50 ohms implies that any load from 25 to 100 ohms would be satisfactory. Therefore, matching it to a 50ohms load rising in a complex manner either side allows only half of the available range to be used.

Why not match it to 25ohms at antenna resonance for a rising characteristic, or alternatively, to 100ohms with an inverted impedance characteristic? Then, look at the HF coaxial feeder, which is almost never a "flat" 50ohms. Indeed, it requires a large suburban block, that contains five or more wave-lengths of feeder to flatten the VSWR curve, even at 28MHz! It is better to cut it for a multiple of a quarter wavelength for a reliable estimate of results at the transmitter end, and also to provide the matching.

Of course, the antenna, particularly for 80 metres, is usually a half-wave dipole of low height (10m or less), with a bandwidth around five percent of resonant frequency (for 2:1 VSWR) and a mid-band impedance about 55ohms. Only at the mid-band frequency can a random length of 50ohms cable be successful.

Now consider the quarter-wave transmission line transformer[1 & 2]:

a It transforms the load impedance across its Zo by the square of the ratio between the two.

b It inverts the load impedance characteristic over the bandwidth from a u shape to an n.

c It transposes reactance from L and C and vice-versa.

d Only half of the total Load/Source VSWR shows at each end. (More accurately, the root of the ratio).

With a quarter wave-length of 72ohms cable (UR70) a 55ohms antenna can be inverted and transformed for the transmitter to see 94ohms at mid-band, falling away each side down through the nominal transmitter 50ohms for the bandwidth to increase by a useful factor of 1.5! This can be further increased to a factor of 2 by compensating the capacity mis-match at the antenna junction.

The compensation required for the quoted example of 55/72ohms is 300pF at 3.65MHz, consisting of the difference between the total capacity of the quarter wave-length of cable actually used, (920pF for UR70 at 69pF per metre) and that of a similar notional cable matching the antenna (1220pF for 55ohms). This value is not critical and can be varied by 30 percent, or more, to adjust the lowest VSWR point two or three percent for convenient system corrections.

The capacitor can consist of an open stub of the same cable, cut for the required capacity (4.5m of UR70) taped to the feeder, or a fixed mica capacitor of suitable voltage rating (250V, or higher) depending on arrangements for water-proofing at the antenna centre.

For those with a transmitter sited more than 13 metres from the antenna there are two alternatives. One is to use a three- quarter wave-length of 72ohms cable with any excess stored in the rafters. The other is to extend the antenna centre for the first quarter wave using a matching cable (52ohms/UR43), then transform with a further quarter wave of 37ohms cable. (Yes! the first quarter wave did that inversion trick even though it may not have transformed very much). Therefore the nest quarter wave must do BOTH for the transmitter to see 25ohms at resonance rising through the nominal 50ohms on either side.

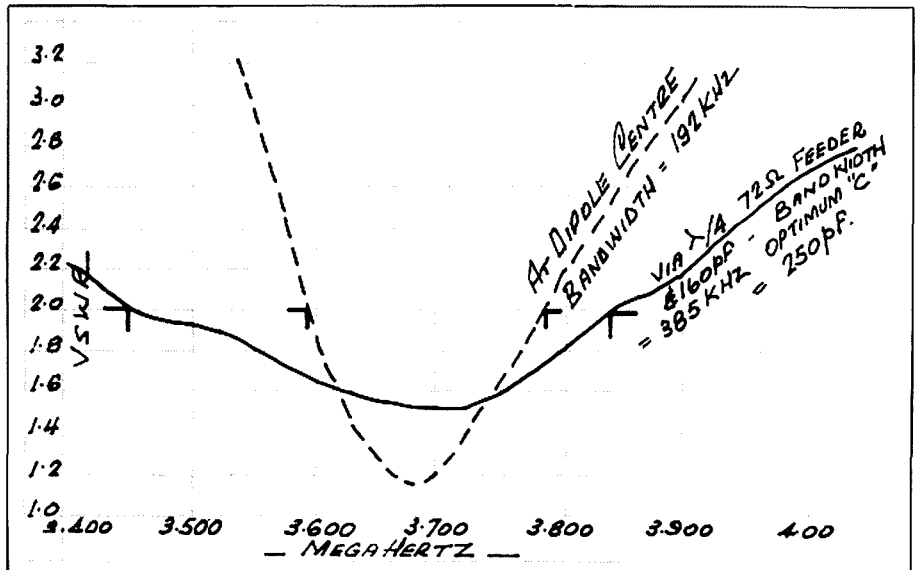


Figure 1.

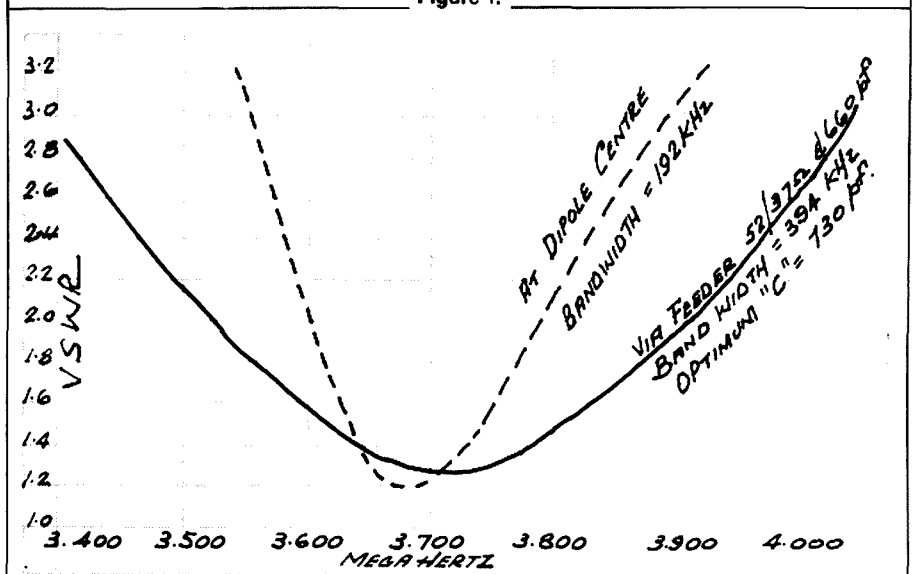


Figure 2.

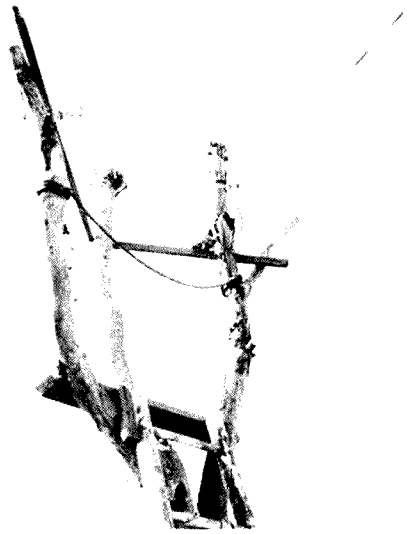
If RG83 cable (35ohms) is available, it may be convenient with RG8 (50ohms), but 37ohms also can be simulated using two lengths of 75ohms in parallel. Otherwise, it can be manufactured by tape-lapping the insulation of "Teflon" insulated shielded equipment wire for a D/d ratio of 1.8[2] and a capacity of 144pF per metre.

Using this arrangement the compensation of 730pF value is required at the 52/37ohms junction of the cables and is probably more convenient as a 680 or 820pF mica capacitor than a 5.4 metre stub.

In conclusion, it is possible to achieve 11 percent (400kHz) of bandwidth on 80 metres (see Figure 1 and 2), and can dispense with the ATU which possibly swallowed up 20 percent of the power, anyway. If it did, we may as well connect a 270ohms power film resistor (of

sufficient wattage rating) across the antenna for the same result.

A transmitter tolerating 2.5:1 of VSWR could cover the whole of the Region 2 (USA) 500kHz on 80 metres. Alternatively, a *thick wire* dipole of, say, cheap coax outer braid could also cover this bandwidth with an VSWR below 2. However, for impedance around 45ohms the better first quarter wave transformer choice is probably the European 60ohms coaxial cable, which is not available here.



Footboard and Safety Rails are convenient additions to this dead tree aerial for testing. The tree is conveniently placed in the centre of the 80 metre dipole!

The same system can be applied, depending on suitable cable availability, for all other bands and most single band antennas, verticals or Yagis, to extend the bandwidth. Of course, it cannot apply for multi-band trap dipoles where, on the next harmonic frequency, the quarter wave transmission line undergoes a metamorphosis to a half-wave.

REFERENCES:

1 Radio Communications Handbook (RSGB)
2 Radio Data Reference Book (Jessop, G6JP)

AR

DISASTROUS TRIP

Hans Rueckert, SWL
Lord Howe Island, NSW. 2898

Rudi Meuller DJ5CQ, VK9NM/LH, and since the 4th December 1985 VK9LM, arrived on Lord Howe Island in September 1985, for his second expedition to the region, with the intention of making as many DX contacts as possible. However, Rudi had no knowledge of what life had in store and met with a series of unfortunate mishaps during his stay.

Rudi stayed with a fellow countryman on the Island and managed to make in excess of 12 000 contacts on all bands, on both CW and SSB. His real challenge, however, was to work on the 80 metre band.

With a two-element beam installed for the 10, 15 and 20 metre bands and a vertical ground plane for 40 metres things were going well. After about two weeks, Rudi was eager to try his 80 metre delta-loop and climbed a 20 metre tall pine tree to install it. Next morning the antenna was on the ground, brought down by a severe storm — Rudi was to install five more 80 metre antennas including a dipole and an inverted Vee.

On 6th November, Rudi complained of feeling unwell but, as he was 20 000km away from home and family, was reluctant to see a medical practioner, but by the 9th November he was so bad that he had to be forcibly taken to see the local doctor, who also happened to be an amateur, Ken VK9LK. Ken diagnosed a serious illness which required emergency treatment.

A RAAF medical team, complete with operating theatre, four doctors and staff arrived from Sydney at 1am on 10th November in a Hercules aircraft. Within one hour, the medical team had set up in the three bed hospital on the Island, and performed a life- saving operation on Rudi. He was then taken with them back to hospital in Sydney.

Rudi required nearly four weeks recuperating in Sydney, the first 11 days in hospital, the balance staying with Manfred VK2BZW. It is true to say though, you can't keep a good DXer off the air as Rudi was frequently heard talking on Manfred's mobile station from the parking area of the hospital. He returned to LHI on 5th December, and once again repaired his 80 metre antenna.

However, with only 80 watts on his TS-820, he only managed to contact the occasional JA or W station, and although he could hear Europe he only contacted five OH, one I, three SM, one OE and one YU stations.

Rudi and Manfred during Rudi's sojourn at a Sydney hospital.

On 6th January, disaster struck again when Rudi received word from Germany that his mother had been admitted to hospital with a serious illness and his wife had met with a minor car accident on the icy roads whilst returning from the hospital.

But worse was to come. On the 8th January, Manfred VK2BZW, called to inform Rudi that the building which housed his home-base, DJ5CQ, had burned to the ground and was completely destroyed.

The irony of Rudi's sad saga was, after giving 30 000 stations Lord Howe Island during his two expeditions to the Island, Rudi received a call from his station only 12 hours before the fire. A young German amateur was operating from Rudi's shack in Germany so Rudi could hear what his equipment sounded like on Lord Howe.

Rudi's QSL information for the expedition is to his home address, Alter Main 23, D8601 Ebing-Bamberg, West Germany.

AR

Picnic at Seventeen Mile Rocks

Can this be the oldest VK4 group-photo to survive the ravages of time?

This gathering of experimenters (amateurs), their families and friends (approximately 36 in all), was taken on the occasion of the First Annual Picnic of the Queensland Wireless Institute held on the 19th March 1922, at Seventeen Mile Rocks, located on the Brisbane River. The motor launch JOYCE was hired for the occasion.

The only person known to this writer is A E Dillon, seated on the extreme left and wearing a hat. *Who are the others? ? ? (Can any readers help?).*

Contributed by Alan Shawsmith VK4SS

QSP

ENDANGERED LIVES

A CB operator was recently fined $2 500 in the Cairns Magistrates Court for making false distress calls by CB radio and in so doing, endangered the lives of others on many occasions.

Contributed by Lawrie White VK4FJC. Reference material the Cairns Courier Post, 23rd January 1986.

Novice Notes

REFERENCES

Power MOSFET Transistor Data — Motorola.
Solid State Design — ARRL.
Practical RF Design Manual — DeMaw.

I would be very interested to receive your comments on this, and any other project that you would like to see appear in this column.

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

FOUR-WATT CW TRANSMITTER FOR 80 METRES

Here is an up-to-date, relatively simple CW transmitter for you to try. Parts count has been kept to a minimum without sacrificing performance. Arrangements have been made for factory-made printed wiring boards, and a parts retailer has agreed to supply a kit of the necessary components at reasonable cost.

PERFORMANCE

Frequency	3.5-4MHz (depending on crystal)
Output Power	Typically 4 watts into 50 ohms
Spectral Purity	All harmonics at least 50dB below fundamental
Keying Ratio	100 percent with minimal click, chirp or whoop
Supply	Nominally 12 volts at 1 amp
Load Impedance	50 ohms. Will withstand any SWR without damage
VXO Shift	About 2kHz (option)

CIRCUIT

The crystal oscillator at Q1 is keyed on and off via Q2 — which supplies a shaped supply voltage to the oscillator. A compromise in rise and fall times is necessary to yield a sufficiently *crisp* keying characteristic consistent with minimal click and chirp (a crystal is essentially a mechanical device, so some inertia exists, which can result in chirp or whoop if the oscillator is ramped too slowly). The keyed CW signal is applied to the broadband amplifier at Q3, which provides about 20dB gain and 100mW of output power. Q4 is a new generation power MOSFET, intended primarily for use in switcher-type power supplies. These devices will operate at sufficient speed for Class B RF service, at 3.5MHz. They are slightly cheaper than a conventional bi-polar device for the same power level, more tolerant of load mismatch, unlikely to suffer from thermal runaway problems, and have a higher input impedance. Q4 raises the power level to about 4 watts. The output impedance is calculated:

$$Z = \frac{Vcc^2}{2Po}$$

$$= \frac{144}{8}$$

$$= 18 \text{ ohms},$$

where Vcc = supply voltage and Po = expected output power. Broadband transformer T2 has an impedance ratio of 4:1, which provides a reasonable match to 50 ohms (with broadband transformers like T2, we can only obtain integer-squared ratios, ie 1, 4, 9 and so on). The wave-form emerging from the drain of Q4 can contain a significant harmonic content, and a low pass filter is necessary to reduce these components to an acceptable level, in this case —50dBc.

CONSTRUCTION

The printed wiring board accommodates all the components. Some of the parts may have longer lead spacing to those on the board. There is no reason to prevent these being mounted in the upright position if this is a problem. The power MOSFET Q4 should have a small TO220 heatsink flag attached. A smear of heatsink compound or petroleum jelly should be applied to the interface for efficient heat transfer.

Broadband transformers T1 and T2 are made as follows:

The Amidon FT50-43 cores must first be coated with some kind of enamel, such as Estapol or shellac. This prevents the two windings from shorting should a scratch occur on the wire enamel. Give the cores a day or two in the sun to dry completely. Take two 300mm lengths of number 22 B&S (0.64mm) enamelled wire. Lay them parallel and twist the ends together at one end. Clamp this end in a vice. Now draw a cloth through the pair to remove any wrinkles, then twist the free ends together. Fix the pair in the chuck of a hand-drill. Whilst keeping the wire taut, turn the drill until there are about three twists per centimetre. Give the drill a tug to set the twists, then remove the pair. Carefully thread the pair through the core until there are about 11 loops. Cut the lead lengths to about two cm, and remove about one cm of enamel from each of the four leads. With a multimeter set to ohms, locate the respective windings. Now connect the end of one winding to the start of the other winding to form the tap. Do not solder these together, as a hole for each lead has been provided on the board.

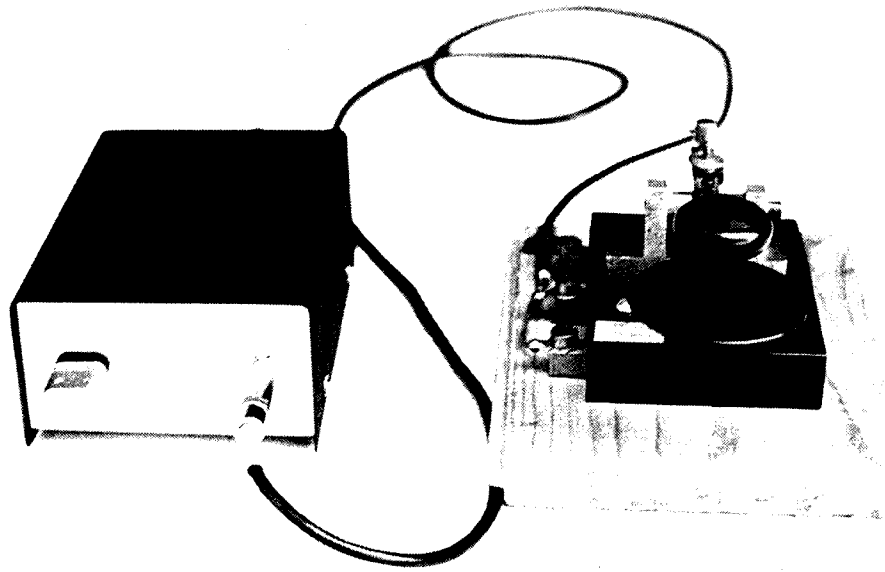
No special precautions are necessary for the remaining components. It is desirable that the PWB be mounted in a metal enclosure. Remember to provide some holes in the lid for ventilation of the power MOSFET output transistor.

It will be found operationally more convenient to mount the crystal socket on the front panel of the box. If you are fortunate in having lots of crystals available, there is nothing to prevent you from including a multi-position switch to make frequency changing more rapid. The 3.580MHz crystal with solder type leads will not require a socket.

If a variable crystal oscillator (VXO) is required, a variable capacitor with a maximum C of about 300pF (not critical) may be inserted in the *earthy* end of the crystal connection. The PWB has been planned so that the track may be cut, and the lead for the capacitor soldered to the spare pad provided. The frame (stator) of the capacitor is connected to the box, of course. Remember to allow extra room for the capacitor if a VXO is to be fitted (the box shown in the photo and the one supplied in the kit will probably be too small for most capacitors). If a crystal is being ordered from J&A for VXO, remember to specify a *rubbery* one.

TESTING

After checking that all components are correct and properly placed, the 12 volt supply may be



PARTS LIST

Capacitors	Where used
47pF Ceramic >25V	C3
220pF Styroseal 'poly'	C1
390pF Styroseal 'poly'	C2
820pF Styroseal 'poly'	C14, C17
1800pF Styroseal 'poly'	C15, C16
1000pF Ceramic >25V	C8
0.047µF Ceramic >25V	C4, C5
0.1µF Ceramic >25V	C6, C7, C9, C10, C11, C12, C13

Resistors

2.7 ohm ¼W or ½ 5%	R10
10 ohm ¼W or ½ 5%	R12
68 ohm ¼W or ½ 5%	R11, R14
150 ohm 1W 5%	R13
470 ohm ¼W or ½ 5%	R3, R6
1 kohm ¼W or ½ 5%	R9
1.8 kohm ¼W or ½ 5%	R7
2.2 kohm ¼W or ½ 5%	R8
5.6 kohm ¼W or ½ 5%	R2
10 kohm ¼W or ½ 5%	R1, R5
22 kohm ¼W or ½ 5%	R4

Semi-conductors

2N2222	Q1
2N3638	Q2
2N3053	Q3
Motorola IRF510	Q4
6.8V, 400mW zener	D1

Inductors/Broadband Transformers

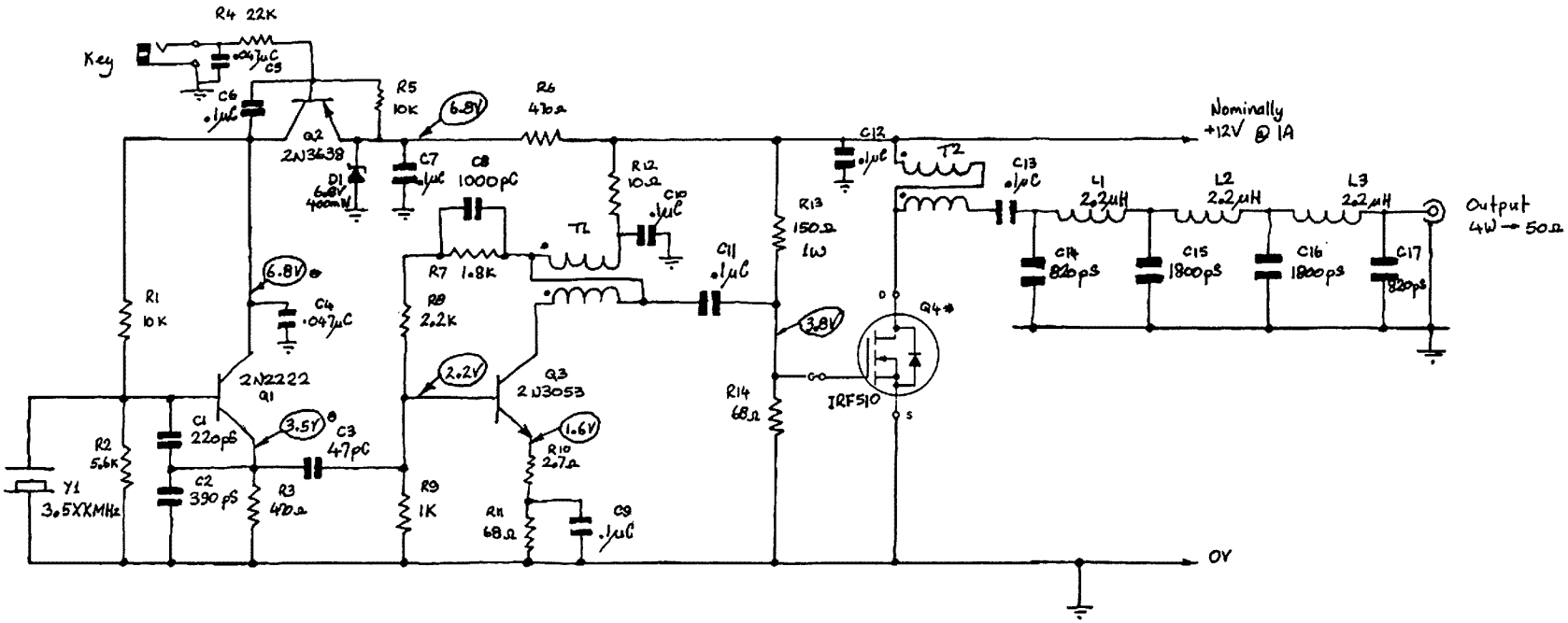
FT50-43 Amidon Cores	T1, T2
T68-2 Amidon Cores	L1, L2, L3

Crystal

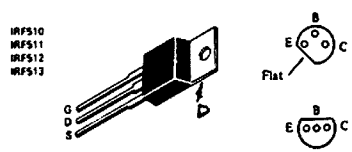
Crystal, 3.5XXMHz (your favourite frequency). Crystal must be active. Some television and clock crystals available ex-stock around 3.580MHz Y1

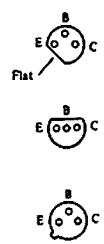
Hardware

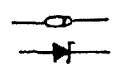
Printed wiring board, heatsink for Q4, key jack, antenna connector, screws, nuts, 22 B&S (0.64mm) enamelled wire, socket for crystal (if not solder-in type), etc.



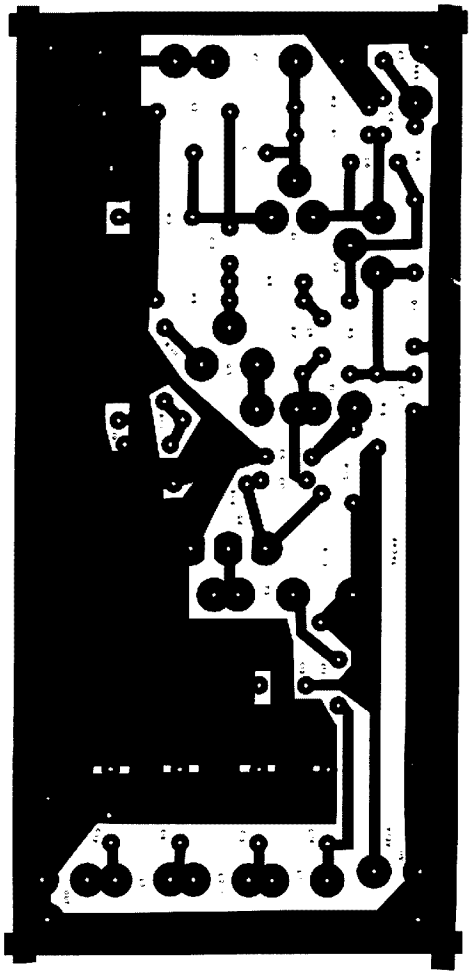
T1, T2: ≈ 11 loops number 22 B&S (0.64mm) twisted bifilar on Amidon FT50-43 lacquered core.
L1, L2, L3: 16 turns number 22 B&S on Amidon T68-2 core.
S: Styroseal or Polypropylene.
C: Ceramic.
All resistors ½W or ¼W 5% except R13, which is 1W.
* Heatsink attached to Q4.
θ Measured with key closed.







Circuit Diagram.



lamp connected to a coaxial connector to suit. When the key is closed, about four watts should be indicated on a power meter, or the lamp should be brightly lit, indicating that the transmitter is working. Listen to the signal on the station receiver. It should sound clean, without excessive chirp, click or whoop. Under 50 ohm load conditions, the transmitter will draw about 900mA from a 12 or 13 volt supply. By the way, the supply voltage is not critical, anything up to about 15 volts should not damage the output MOSFET.

OPERATION

Some method of switching the antenna from the transmitter to the receiver must be provided. A relay, or an ordinary panel switch will do, but remember to solder all the braids of the coax together where they connect to the switch or relay. There is no need for the 12 volt supply to be removed from the transmitter during reception, as the oscillator will be in the off-state. By closing the key without switching the antenna over, the output frequency may be checked on the receiver without putting a signal to air. Side-tone monitoring during transmission is of course provided by the receiver. It will probably be found necessary to turn the RF gain down to minimum to provide a comfortable level.

PARTS SOURCE

Most of the traditional radio components suppliers have deserted us (is it our fault?). However, Truscotts of Croydon, Victoria, have agreed to supply a kit of parts as follows:

Basic Kit, including PWB . . . $25.50

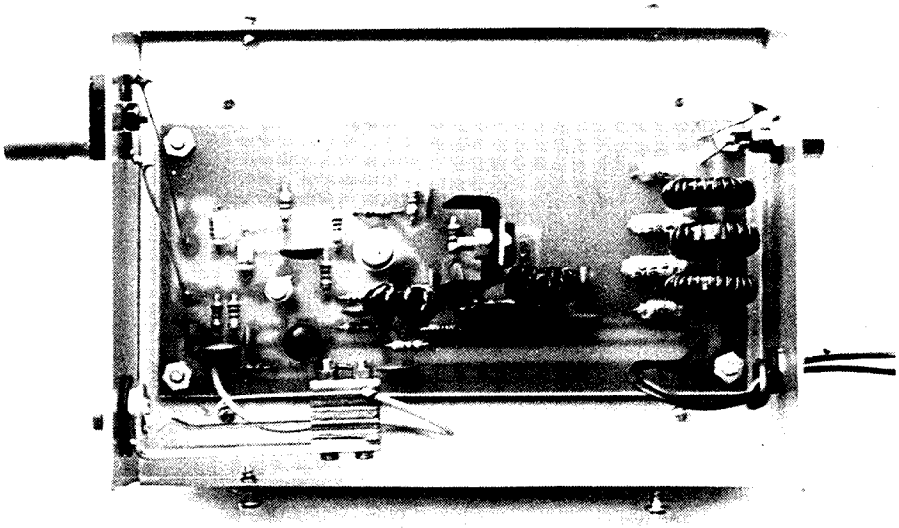
Box (as in photograph) . . . add $5.50

Crystal — solder in type, 3.58MHz . . . add $3.50

Supplier — Ian J Truscott's Electronic World, 30 Lacey Street, Croydon, Vic. 3136. Telephone: (03) 723 3860.

A crystal on your choice of frequency may be obtained from:

J and A Crystals, 20 Delville Street, Mentone, Vic. 3194.



applied. A 50 ohm dummy load or power meter must be connected to the output connector of the transmitter. If a dummy load/power meter are not available, a reasonable substitute could consist of a 12V/200mA/2.4W, or a 12V/4W

Specify Style D "rubbery" for VXO, and the frequency. Anywhere from 3.501 to about 3.580MHz for full-calls, and 3.526 to 3.600MHz for novices is suggested.

AR

REPORT OF 28th JOTA

Most of the reports from various Branch Organisers and Liaison Groups associated with the 28th Jamboree-on-the-Air, which was held on 19-20th October 1985, commented on the poor propagation, due to the low level of the sunspot cycle. It is hoped there will be an improvement this year.

All Organisers offer their thanks to the amateurs for their help and to the WIA for support of JOTA and other scouting events.

As part of the WIA 75th Anniversary, the WIA provided special QSL cards to all participating JOTA stations.

JOTA is the only Annual International event on the Australian Scout and Guide Calendar, and the only International event in which the vast majority of members could ever participate. In a country as isolated as Australia, JOTA is extremely important to the concept of the fourth Scout Law — **Brotherhood.** *More amateurs are always needed and are most welcome to participate, so make 1986 your year to assist this goodwill.*

The official Scout call signs (VK*S??) are continuing to increase in numbers and VK*GGA (for the Guides) is also registered in many states.

The general statistics of stations that participated is as follows:

In VK1 five stations participated and had 72 contacts. VK2, 114 stations for 1669 contacts. VK3, 180 stations and 1439 contacts. VK4, 72 stations and 914 contacts. VK5, 84 stations worked 812 contacts. VK6, 72 stations for 1110 contacts. VK7, 24 stations and 281 contacts. There was an overall total of 551 stations participating, using 1140 call signs with 6297 contacts recorded. This compares with 1084 call signs in 1984, who worked 5623 contacts.

Please become involved in the 1986 JOTA and double the above figures!

Condensed from the Report on the Australian Participation in the 28th Jamboree-on-the-Air.

AR

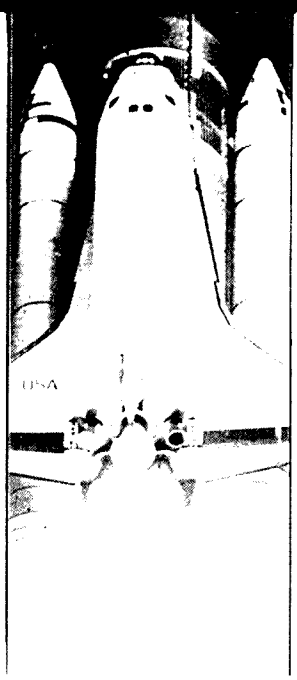
AIMING HIGH WITH COMMUNICATIONS ACCESSORIES FROM GFS

WAY OUT FRONT IN AIRBAND PORTABLES THE NEW ATC-720X

- BALLOONISTS
- AERO CLUBS
- HOME BUILTS
- EMERGENCY COMMS
- RESCUE OPS
- ULTRA LIGHTS
- GLIDERS
- AIRPORT SECURITY
- HANG GLIDERS
- AIR SHOW COMMS
- EXPERIMENTAL

920 CHANNEL NAV COM — PLUS 4 MEMORY SCAN PORTABLE TRANSCEIVER

The New ATC-720X provides inexpensive airband communications for a wide range of applications. Its most important includes promoting the peace of mind which comes from knowing you have an emergency back-up transceiver with you. It is supplied complete with rubber antenna, alkaline batteries and carrying strap **$749** - S.T. - $14 P&P $889 Inc S.T.



AR-2002 Continuous Coverage 25-550, 800-1300 MHz Scanner

If you want continuous coverage, AM/FM wide & narrow with 20 memories we suggest you choose the AR-2002 from GFS

$799 +$14 P&P

AR-RS232 Computer Interface for AR-2002 $499 + $8 P&P

LOW LOSS FOAM DOUBLE SHIELDED COAXIAL CABLE

LOSS IN DB/30 METRES

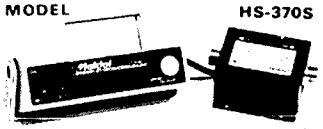
TYPE	100 MHz	200 MHz	400 MHz	900 MHz
5D-FB	1.86	2.70	3.90	6.00
8D-FB	1.20	1.74	2.58	3.90
10D-FB	0.99	1.44	2.10	3.30
12D-FB	0.84	1.23	1.80	2.79
RG-8/AU	2.20	3.20	4.70	8.00
LDF-450	0.75	1.40	1.80	2.50

FB SERIES CABLE & N CONNECTORS

CABLE		N-CONNECTORS	
5D-FB	$2.90m	NP-5DFB	$12.00 ea.
8D-FB	$4.20m	NP-8DFB	$12.40 ea.
10D-FB	$6.30m	NP-10DFB	$12.90 ea.
12D-FB	$8.70m	NP-12DFB	$13.70 ea.

VHF-UHF SWR-POWER METER

MODEL HS-370S



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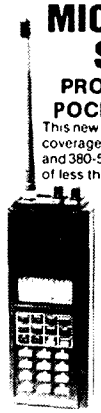

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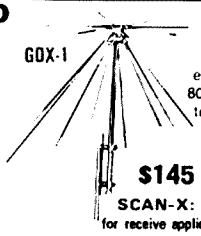

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BAND PLANNING FOR THE VHF AND UHF BANDS

Ron Henderson VK1RH
171 Kingsford Smith Drive, Melba, ACT. 2615

This article continues our band planning review, concentrating on the very-high and ultra-high frequency bands. For consistency it uses the same definitions as the earlier HF band planning paper; these were extracted from the WIA Call Book and are reproduced below for reference.

The following terminology has been adopted for the purposes of the Australian Band Plan:

CW only

Narrow Band Modes (other than CW) — for example occupying bandwidths less than 2.5kHz, such as ASCII, Baudot (RTTY), AMTOR (ARQ/FEC) and Packet Radio.

Wide Band Modes — such as, for example SSB, FM, FAX, SSTV and Data Transmissions at greater than 300 Baud.

It is necessary, however, to indicate the use of FM separately from "Wide Band Modes" because of its greater occupied bandwidth.

International considerations impinge less on VHF/UHF band planning than they did in the previous HF considerations. Indeed, provided satellite and weak signal DX propagation modes (EME, Meteor Scatter and Auroral Scatter) are co-ordinated, we have greater flexibility with our national VHF/UHF Band plans. The need to conform to other nations repeater split frequencies is a desirable, but not a dominant aim as appropriate changes can be made in transceiver firm-ware in the worst case, furthermore, the point has been made before that commercial interests should not drive our Band Planning.

In contrast to HF Band planning, the VHF/UHF plans need to be defined in considerably more detail to provide adequate guidance (ie a suitable band segment) for all likely users with their many and varied transmission modes. Despite that comment, the principle Band plan sub-divisions become CW, Beacons, Phone, Satellites and FM. The call for discrete narrowband segments is less at VHF/UHF for RTTY and Data Transmissions are normally made using AFSK tone bearers which frequency modulate the carrier to produce a resultant Wide Band signal that is accommodated in the FM sub-band. Packet Radio falls into this category also, the Baud rate and modulation means employed determining the occupied bandwidth.

Table 1 — Agreed WIA 52MHz Band Plan.

POLICY REF	FREQUENCY	DETAILS
81.09011	50.000-52.000	FTAC authorised to provide Band Plan.
77.093	52.000-52.010	EME
	52.010-52.050	DX CW 52.025 CW Call Freq 52.050 MS Call Freq
	52.050-52.100	DX CW/Phone 52.075 RTTY Call Freq 52.100 Pri Phone Call Freq
	52.100-52.300	CW/Phone 52.200 Sec Phone Call Freq 52.300 SSTV Call Freq
	52.300-52.400	Beacons — Secondary
	52.400-52.500	Beacons — Primary
81.0906	52.500-53.000	General All Modes
	53.000-54.000	FM Simplex and Repeaters
81.0907	53.000-53.375	Repeater Inputs — Allocated two/state
	53.400-53.575	Simplex Frequencies
	53.500	National FM Calling
	53.600-53.975	Repeater Outputs

NOTE: DOC provided the conditions for use of 50-52MHz — See Call Book.

50MHz BAND

Turning now to the bands in detail, Figure 1 shows the Band Plan for the 50-54MHz band, which is repeated in Table 1 with policy references. Not shown, but published in the 1984-85 and 1985-86 WIA Call Books are:

a The DOC conditions of use for the 50 to 52MHz segment, which is conditional upon location and transmission hours of Channel 0 television.

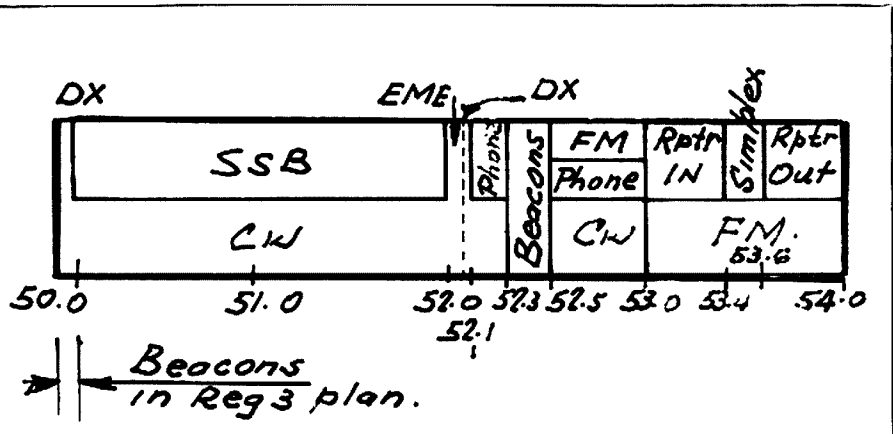


Figure 1.

b The beacon frequency allocation details where the relevant 10kHz steps align with the state call sign digits; eg VK1 has beacon frequencies of 52.410MHz primary and 52.310MHz secondary.

c The FM channel spacings which are 25kHz and the repeater split of 600kHz. There are sufficient repeater channels to allow two- per-state.

The only international consideration arising from the IARU Region 3 Band Plan shows a beacon sub-band coincident with our DX CW window from 50.000 to 50.100MHz. *Is this a problem for DX working?*

The interval from 52.000 to 52.500MHz is divided into many differing use sub-bands as shown in Table 1. In general, CW, Narrow Band Modes and Phone (<6kHz BW) exists below 52.500MHz, Wide Band Modes are added for the general segment 52.500 to 53.000MHz and FM dominates the upper megahertz.

This leads to a series of questions as to the satisfactory allocation of spectrum space:

** Is the allocation 52.100 to 52.300MHz adequate for Phone (SSB)?*

** Is the FM segment an out-of-proportion allocation seen on a MHz/user basis? Indeed, are repeaters desirable on the band, and how many?*

** Can the FM simplex channels be used for data (bandwidth wise they are compatible) or should Data Transmissions be in the general all modes segment 52.500 to 53.000MHz, where even greater bandwidth may be used?*

** Is there a need for an allocation for remote control applications; eg to remotely control receivers sited in optimum locations from more noisy sites as is often done for displays and demonstrations?*

144MHz BAND

The most popular of Australian VHF/UHF bands, the two-metre or, more correctly, 144-148MHz band is shown in Figure 2, and repeated in detail in Table 2 with policy references. This Band Plan also shows the progression from CW to Phone/CW then FM modes, interspersed with beacons and satellite sub-bands. Of note is the allocation of 50 percent of this band, in Australia, to FM and on a users-per-mode basis this is probably an equitable share. Not shown, but available from the Call Book, are beacon allocations (once again the 10s of kilohertz denote the call sign area digit), FM channels, which are 25kHz and a repeater split of 600kHz.

International consideration from IARU Region 3 are EME and satellite sub-bands which adequately align with the Australian Band Plan.

The interval 144.000 to 144.600MHz is divided into several sub-bands as shown in Table 2.

The questions posed by this Band Plan include:

** Can possible demands for further FM channels be supported and accommodated? Is there a real need for more repeater channels,*

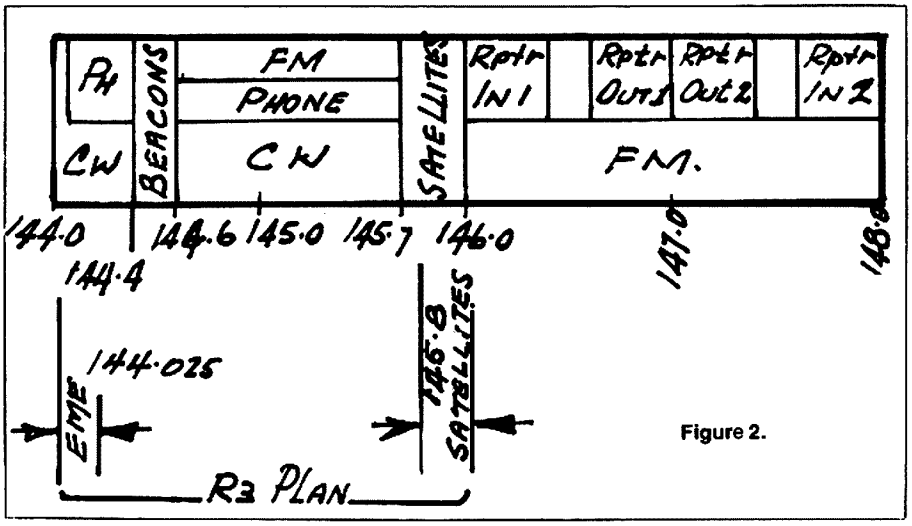


Figure 2.

Table 2 — Agreed WIA 144MHz Band Plan.

POLICY Ref	Frequency	Details
77.094	144.000-144.010-	EME
	144.010-144.050-	DX CW. 144.025 CW. Calling 144.050 MS Calling
	144.050-144.100-	DX CW/Phone 144.075 RTTY Calling
	144.100-144.400-	CW/Phone 144.100 Pri Phone Call 144.200 Sec Phone Call 144.300 SSTV Calling
	144.400-144.500-	Beacon — Primary
	144.500-144.600-	Beacons — Secondary
	144.600-144.700-	General All Modes
	145.700-146.000	Satellites
	146.000-148.000	FM Simplex and Repeaters
79.097C	146.000-147.000	Primary Voice
	146.025-146.400	Repeater Inputs
	146.425-146.600	Simplex 146.500 National Simplex 146.450 Primary Voice 146.550 Primary Voice 146.600 RTTY
	146.625-147.000	Repeater Outputs
	147.000-148.000	Local and Special Purpose
	147.025-147.375	Repeater Outputs
	147.400-147.600	Simplex 147.400 ATV Liaison 147.425 ATV Liaison 147.450 ATV/ SSTV/FAX 147.475 SSTV/ FAX Liaison
77.20.02		147.500 Sec Nat Calling
79.097C		147.550 Micro Nets 147.575 Data Nets 147.600 Data Nets
	147.625-147.975	Repeater Inputs

are the existing repeaters adequately utilised or are they status symbols for regional amateur radio interest groups?

** Are the presently designated Data and RTTY FM simplex and repeater channels sufficient and adequate for future needs (again they are bandwidth compatible) or should Data Transmissions be in the general all modes segment 144.600 to 145.700MHz, where even greater bandwidths may be used? Is there still a need to discriminate between RTTY and Data, for in computer jargon isn't the former a subset of the latter?*

** Is there a need for an allocation for remote control, or repeater linking, or should these actions be respectively accommodated in the general all-modes segment and via normal repeater output frequencies?*

** The paging services just above 148MHz are causing problems for amateur repeaters on the higher input frequencies. This is exacerbated by repeater receivers being sited at advantageous locations. As the pager transmitters are similarly sited they could interfere with mobile amateur receivers if FM voice systems are retained at the upper band edge. Perhaps a solution is to re-allocate the upper half megahertz to data systems. As data systems use discrete tones it should be possible to select these clear of paging tones and the error correction facilities would ensure continued usable transmissions should interference arise. Has this proposition any merit?*

420MHz BAND

The existing Band Plan for the 420 to 450MHz band, shown in Figure 3 and detailed in Table 3, with policy references, is complex and not aided by the Amateur Service being the secondary service. It is also the first Australian band in which really wideband transmissions are authorised as evidenced by the two ATV channels allocated, one even being of DSB bandwidth to facilitate ATV with quite simple equipment.

International constraints, as reflected through the IARU Region 3 Band Plan, include a weak signal segment and a satellite allocation, both are reflected in the published Australian Band Plan.

The larger ATV channel, 420 to 432MHz is located at the lower edge of the band, below the allocation existing for many amateur communities in our region and the second, 433 to 450MHz (a VSB channel), is located at the remote band edge providing maximum separation for in-band repeaters.

The FM allocation from 433 to 440MHz is split by the international satellite sub-band from 435 to 438MHz, giving rise to a 5MHz repeater split frequency. Furthermore, the repeater input and output channels (using 25kHz spacings) are themselves split to accommodate a FM

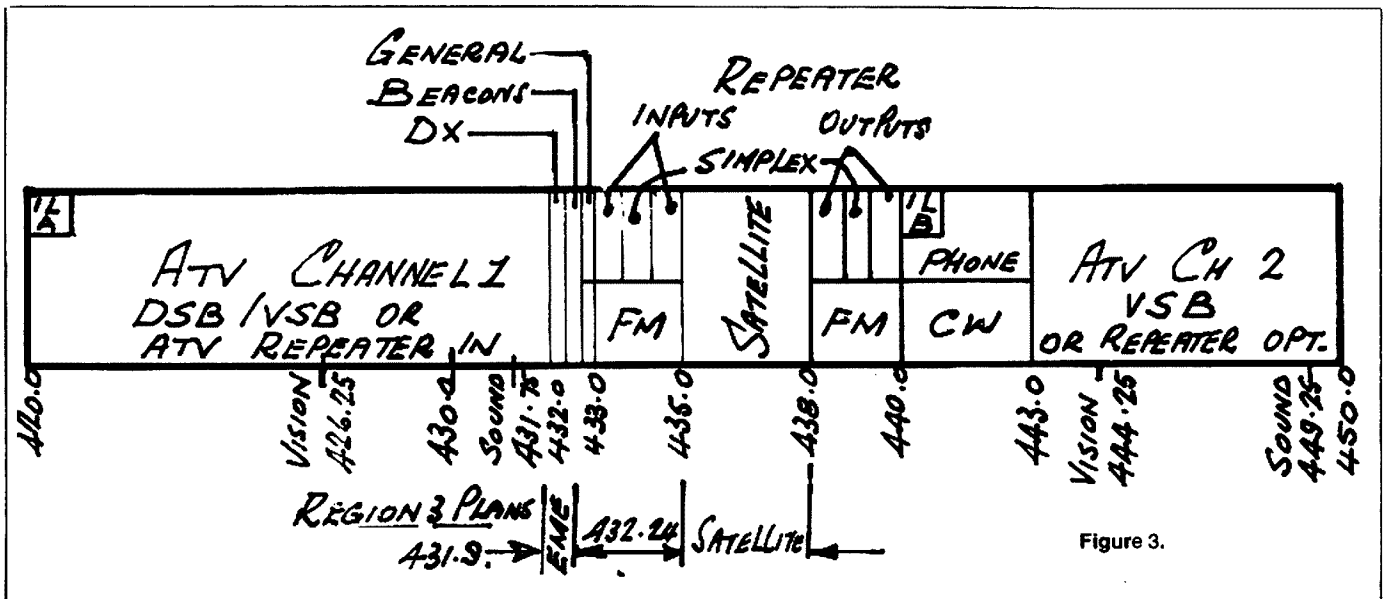


Figure 3.

Table 3 — Agreed WIA 420MHz Band Plan.

POLICY REF	FREQUENCY	DETAILS
75.200.2	420.000-432.000	ATV Channel 1 DSB/VSB
		426.250 Vision
		431.750 Sound
85.09.12/2	420.050-421.000	Repeater Linking — A pairs
75.20.2	432.000-432.010	DX EME
	432.010-432.025	DX CW
		432.025 Calling Freq
	432.025-432.050	DX MS
		432.050 Calling Freq
	432.050-432.075	DX RTTY
		432.075 Calling Freq
	432.075-432.100	DX Phone
		432.100 Pri Calling Freq
	432.100-432.200	Phone
		432.200 Sec Calling Freq
	432.200-432.300	SSTV
		432.300 Calling Freq
	432.300-432.400	CW/Phone
77.096	432.400-432.600	Beacons
77.096	432.600-433.000	General All Modes
80.1707D	433.025-433.725	FM Repeater Inputs
		433.075 Mobile Voice
		433.125 RTTY
		433.225 Sec Mobile Voice
		433.275 RTTY
		433.375 Mobile Voice
		433.425 Data
		433.525 Nat Pri Mobile Voice
		433.575 Data
		433.625 WICEN
		433.675 Sec Mobile Voice
		433.725 SSTV
	433.750-434.250	Any FM
	434.275-434.975	FM Repeater Inputs
		434.275 Mobile Voice
		434.325 RTTY
		434.425 Mobile Voice
		434.575 Mobile Voice
		434.725 Mobile Voice
		434.875 Mobile Voice
	435.000-436.000	Satellites
	438.025-438.725	FM Repeater Outputs
	438.750-439.250	FM Simplex
		438.775 RTTY
		438.825 Sec Voice
		438.875 Data
		438.925 SSTV
		439.000 Nat Pri Voice
		439.125 Sec Voice
	438.275-439.975	FM Repeater Outputs
85.09.12/2	440.050-441.000	Repeater Linking — B Pairs
76.1703	440.000-443.000	Experimental — All Modes
75.20.2	443.000-450.000	ATV Channel 2 VSB
		444.250 Vision Carrier
		449.750 Sound Carrier

simplex sub-band in the middle of each.

Provision has been made in the Band Plan for a system of interlinking pairs (sub-band A 420 to 421MHz, sub-band B 440 to 441MHz, that is, a 20MHz split) for use to link repeaters, WIA broadcast facilities and for remote control of receivers.

The interval 432 to 433MHz is subdivided to serve a number of potential users, as shown in Table 3. Not shown, but available from the Call Book are DX calling frequencies, beacon allocations and FM repeater and simplex channel frequencies.

There are a few questions which can be raised about this Band Plan

** Do the FM repeater frequencies need to be tidied up to group together the simplex frequencies?*

** Is the interlinking pairs allocation adequate for the foreseeable future?*

** Should we aim to discourage DSB ATV? Should we consider a phase-out date for DSB ATV? Or does it serve a useful purpose in permitting newcomers to ATV to build simple equipment?*

** Are there adequate channels provided for data in the FM sub-band or should data go into the all modes segment 440 to 443MHz where even wider bandwidths may be employed?*

1296MHz Band

The Band Plan for the 1240 to 1300MHz band, as shown in Figure 5 and detailed in Table 5 with policy references, was developed only recently and adopted at the 1985 WIA Federal Convention. The international considerations of the plan include satellite and EME sub-bands, which align with the IARU Region 3 Band Plans.

Other features of the Band Plan are:

a Two wide ATV channels, well separated by 28MHz to allow in-band repeaters.

b FM sub-bands for repeater, simplex, relays and linking purposes.

c Sub-bands for in-band and cross-band linear transponders.

d A separate sub-band for Digital and Packet Radio.

e Avoidance of band space adjacent to air traffic control radars, a guard-band of ±5MHz

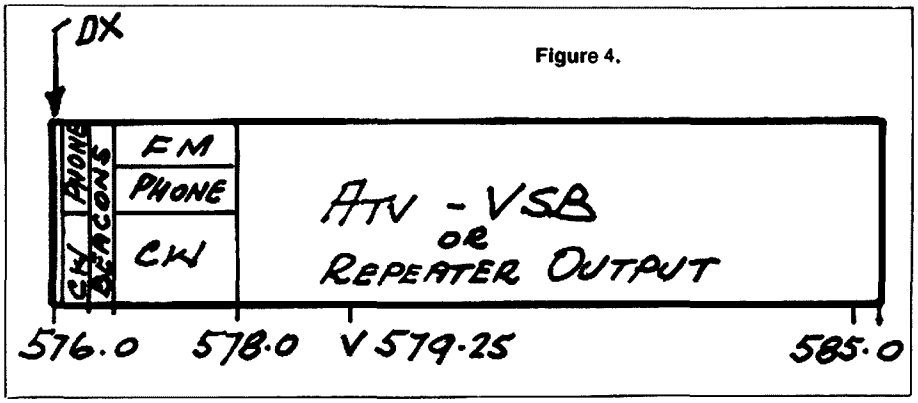


Figure 4.

Table 4 — WIA Band Plan for 576MHz Band.

BAND SEGMENT	USAGE
576.000-576.010	EME only
576.010-576.050	DX
	576.025 CW Calling
576.050-576.100	DX
	576.050 Phone Calling
	576.075 RTTY Calling
	576.100 SSB Calling
576.100-576.400	General
	576.200 SSB Calling Sec
	576.300 SSTV Calling
576.400-576.500	Beacons Sec
576.500-576.600	Beacons Pri
576.600-578.000	General All Modes
578.000-585.000	ATV VSB

576MHz BAND

The 576 to 585MHz band is a temporary allocation to Australian amateurs in the UHF broadcasting (TV) allocation. Historically, It was part of the old harmonically related series 144/288/576MHz and the Band Plan is shown in Figure 4 and detailed in Table 4.

Over the last year, or so, the WIA has, in keeping with agreed policy, been seeking an assurance from DOC that a band allocation in the vicinity of 576MHz will continue to be available to the Amateur Service, despite increased activity by UHF television. Of recent times, the 576MHz band has provided the repeater output channel for cross-band 420 to 576MHz ATV repeaters and it is for this purpose that negotiations continue with DOC. The WIA has adopted the attitude that an ATV channel is required for repeater outputs, but its precise frequency is open to negotiation and can be any television channel in the vicinity of 600MHz that is clear and available on a regional, or even local use basis.

It is therefore recommended the existing Band Plan remain unchanged, but a fall back position of one UHF television channel for ATV repeater outputs be the WIA attitude. This is virtually implied by policy resolutions from recent Federal Conventions.

is recommended.

Not shown, but available from the Call Book and Amateur Radio are details of:

a The FM channels; 30 repeater channels at 25kHz spacing and 12MHz split, 20 of these channels are allocated to mobile voice, four to RTTY, four to data and two to ATV liaison.

b The beacon sub-band 1296.400 to 1296.590MHz with frequency allocations aligning with state call sign digit, as on the VHF bands.

As the planning for this band was only carried out recently (in 1984/85), it contains some features which may only be present in part if at all in the VHF/UHF bands considered earlier. Interlinking and relay frequencies appear as in the 420MHz band (but not in the 144MHz band as noted in an earlier question). Provision has been made for linear transponders (there is an experimental reduced carrier single sideband (RSSB) repeater active in Great Britain) and a separate Digital/Packet Radio sub- band has been allocated, in addition to FM channels for RTTY and Data Transmissions.

There should not be any need for revisions to this Band Plan so soon after adoption; a change of repeater split frequency is not considered a technically viable option due to the presence of air traffic control radars in the band. As suggested earlier, modern transceiver design should accommodate varying splits in software or firmware.

AMATEUR REVIEW AND ACCEPTANCE

As was said at the conclusion of the earlier HF Band Planning paper, it is now left to you, the amateur, to endorse these current Band Plans, or to record your dissatisfaction with any features through the columns of this magazine, through your WIA Division, Divisional Federal Councillor, or by writing to the WIA Federal Technical Advisory Committee. The last named will co-ordinate comments and present any amendments as appropriate recommendations to the next Federal Convention. Over to you!

AR

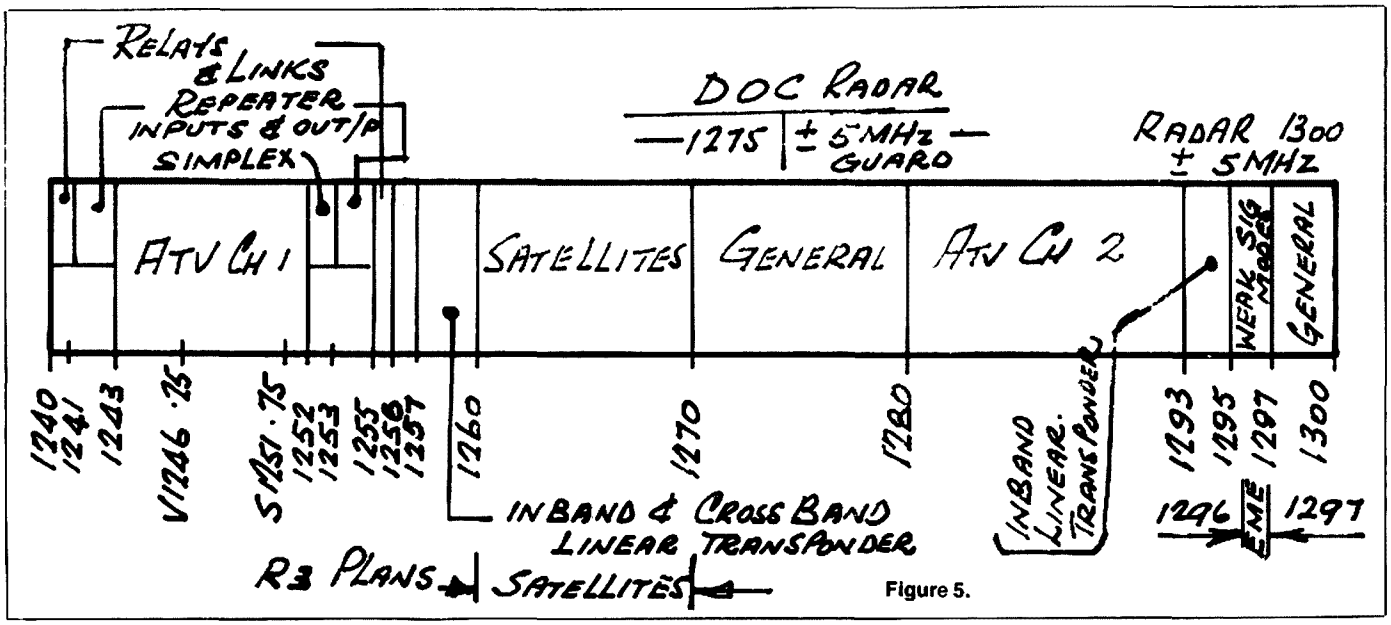


Figure 5.

Table 5 — Agreed WIA 1296MHz Band Plan. (All Refs are 85.09.12/1).

BAND SEGMENT	USAGE
1240.000-1241.000	FM Relays and Links
1241.000-1243.000	FM Repeater Inputs
1243.000-1252.000	ATV Channel 1, Sound 1251.75; Vision 1246.25
1252.000-1253.000	FM Simplex
1253.000-1255.000	FM Repeater Outputs
1255.000-1256.000	FM Relays and Links
1256.000-1257.000	Digital and Packet Radio
1257.000-1260.000	In-Band and Cross-Band Linear Transponder
1260.000-1270.000	Satellite Communication (WARC 79)
1270.000-1280.000	General Use except in areas where these frequencies are in use for Radio Location (Note 2)
1280.000-1293.000	ATV Channel 2, Sound 1292.750, Vision 1287.250
1293.000-1295.000	In-Band Linear Transponder
1295.000-1297.000	Weak Signal Modes, including Beacons (Note 3)
1297.000-1300.000	General Use except in areas where these frequencies are in use for Radio Location (Note 2)

FM REPEATER OUTPUT FREQUENCIES AND RECOMMENDED USAGE

Output: 1253.025-1255.000MHz at 25kHz
Input: 1241.025-1243.000MHz 12MHz Split

FREQUENCY MHz	USAGE
1253.050	RTTY
1253.100	Mobile Voice
1253.150	RTTY
1253.200	Mobile Voice
1253.250	Data
1253.300	Mobile Voice
1253.350	Data
1253.400	Mobile Voice Secondary
1253.500	Mobile Voice Primary
1253.600	Mobile Voice Secondary
1253.700	Mobile Voice
1253.800	Mobile Voice
1253.850	ATV Liaison
1253.900	Mobile Voice
1253.950	ATV Liaison
1254.000	Mobile Voice
1254.100	Mobile Voice
1254.150	RTTY
1254.200	Mobile Voice
1254.250	RTTY
1254.300	Mobile Voice
1254.350	Data
1254.400	Mobile Voice
1254.450	Data
1254.500	Mobile Voice
1254.600	Mobile Voice
1254.700	Mobile Voice
1254.800	Mobile Voice
1254.900	Mobile Voice
1255.000	Mobile Voice

Why are there Sidebands in AM Transmissions?

The simple answer is that, qualitatively, modulation is a mixing process between two or more frequencies and thus produces their sums and differences. In this article, the author explains, particularly for those who are not Old Timers, the quantitative basis of the process.

Greg Baker L20282
Half Moon Road, Mongarlowe, via Braidwood, NSW. 2622

Amplitude Modulation of a carrier wave results in the original carrier, plus two sidebands. Because the production of sidebands is not intuitively obvious, it must be proved mathematically.

A carrier wave has a sinusoidal form which can be represented by either a sine or a cosine formula. Take such a carrier

$$A\cos Xt$$

where A is the amplitude and X is the frequency. Since the carrier can be considered as either current or voltage, A is either amps or volts. The symbol t is, of course, time in seconds. Frequency is measured in radians per second. If we want frequency in Hertz, the formula would become

$$A\cos 2\pi ft.$$

The results are identical whichever is used.

Modulate the amplitude of this carrier with a pure tone

$$B\cos Yt$$

where B is the amplitude and Y is the frequency which is less than X. The resulting wave is

$$(a + B\cos Yt)\cos Xt$$

which on expansion gives

$$A\cos Xt + B\cos Xt\cos Yt$$

Now, eliminating $\sin P \sin Q$ from the well-known trigonometric identities

$$\cos(P+Q) = \cos P\cos Q - \sin P\sin Q$$
$$\cos(P-Q) = \cos P\cos Q + \sin P\sin Q$$

yields (by addition)

$$\cos(P+Q) + \cos(P-Q) = 2.\cos P\cos Q$$

+4or

$$\cos P\cos Q = \tfrac{1}{2}\cos(P+Q) + \tfrac{1}{2}\cos(P-Q)$$

Using this, the modulated wave can be written as

$$A\cos Xt + \tfrac{1}{2}B\cos(X+Y)t + \tfrac{1}{2}B\cos(X-Y)t$$

which is (i) the original carrier, plus (ii) a side frequency of (X+Y), and (iii) a side frequency of (X—Y).

Thus, a single modulating tone yields, in addition to the carrier, two distinct *side frequencies*. These frequencies depend on the carrier frequency X and the frequency of the modulating tone Y. If Y varies across a band of frequencies corresponding to say 0 to 3000Hertz, then so too will the two side frequencies vary up to 3000Hertz either side of the carrier frequency. This is two *sidebands*, an *upper sideband* and a *lower sideband*, each of width 3000Hertz and giving a total *bandwidth* of twice 3000Hertz, ie 6000Hertz.

AR

VK5JSA — the Kangaroo Island Saga

Alan Roocroft VK5ZN
41 Harvey Avenue, Salisbury, SA. 5108

As a contribution to the many facets of the Jubilee 150 celebrations in South Australia during 1986, VK5 amateurs are drawing attention to their state with a series of special event amateur radio operations which are scheduled to take place at various intervals throughout the year. Such operations will go to air under the call sign VK5JSA, and contact with this call will be worth 15 points toward the required total of 150 to be eligible for the *J-150 Award*. To date, much interest has been shown by fellow amateurs world-wide in this award, as is obvious by the intense activity on the special nets which are operational. (See Awards Column, this issue, for updated times and frequencies).

Bill VK5VK, briefs Ron VK5RV on the *Philanderer III* operation which ha shared with Jack VK5FV. The planning stage was held at the home of Bob VK5BJA, in North Adelaide.

Alan VK5ZN, checks the Australian lighthouses dotted around the Australian coastline, watched by Graham VK5AQZ.

The Cape Willoughby landscape. The lighthouse is maintained by the Head Lighthouse Keeper, Phil Dent and his assistant Keith Robinson. The amateurs occupied the visitor's house in the background, 75 metres from the light.

From the 21st January 1986, the first of these special event operations took place when Jack VK5FV and Bill VK5VK, launched VK5JSA/MM aboard the PHILANDERER III during its several crossings daily between Cape Jervis and Penneshaw, on Kangaroo Island. The journeys were of 55 minutes duration, each way, across Backstairs Passage, known as some of the roughest water to be found anywhere around the coast of Australia.

Complete with radios, whips, assorted loading coils, banners and posters (professionally prepared by Peter Koen, secretary of VK5BPA), also assorted hand-out material concerning the Jubilee, the WIA and amateur radio in general, these two *old salts* traded their land-legs for sea-legs.

Their operating location was a tiny corner of the bridge, which was fortunate as there was little room for movement, making it a little easier to stay in the chair while the *shack* was rapidly changing polarisation. Despite numerous discomforts, the intrepid sailors managed to make numerous HF and VHF contacts on each crossing and also from their night-camp at the club rooms of the local football club on the island.

Operation in this vein continued until 24th January, when the operators now destined for Cape Willoughby Lighthouse and a few days rest and recreation, were joined by Bob VK5BJA, Graham VK5AQZ, Alan VK5ZN, Ron VK5RV, Peter VK5PMR and Rob (from the South Coast ARC and soon to be licensed).

The newcomers brought a Land Cruiser and trailer, packed to the limit with equipment and supplies. The group were also met by a Relief Force and car to provide transport across the 40km of bush roads to the eastern tip of the island, where the lighthouse is situated. The group were met at the lighthouse by Phil, the resident light-keeper, his wife Rena and son

From left: Bob VK5BJA, Peter VK5PRM, Jack VK5FV, Bill VK5VK and Phil. Standing: Ron VK5RV, Rena, Alan VK5ZN and Rob Durbridge.

Kevin, who proved to be the most helpful, friendly and cheerful hosts one could ever hope to meet. Nothing was too much trouble for this trio in their efforts to make their guests feel at home. Tea, coffee, cake and biscuits flowed freely and continuously, along with odds- and-ends which had inadvertently been overlooked.

(Over the years in their chosen profession, the whole family had become used to radio in some form or another, but they were thrilled to be able to witness amateur radio with some of the operators and expressed serious interest in getting a license. Watch for the lighthouse on a regular basis sometime in the future).

After refreshments upon arrival, Phil took note of the inquiry regarding an extremely noisy insulator on the pole outside the visitors sleeping-quarters. Massive sparks were clearly visible to an accompaniment of snaps and crackles and concern was expressed that HF radio would be nearly impossible unless this problem was rectified.

The following morning, whilst Graham and Ron were assembling the 204BA, the rest of the group were running up and down, like a colony of ants, erecting an *antenna farm* on

The lighthouse with the first jib on the top right of the house.

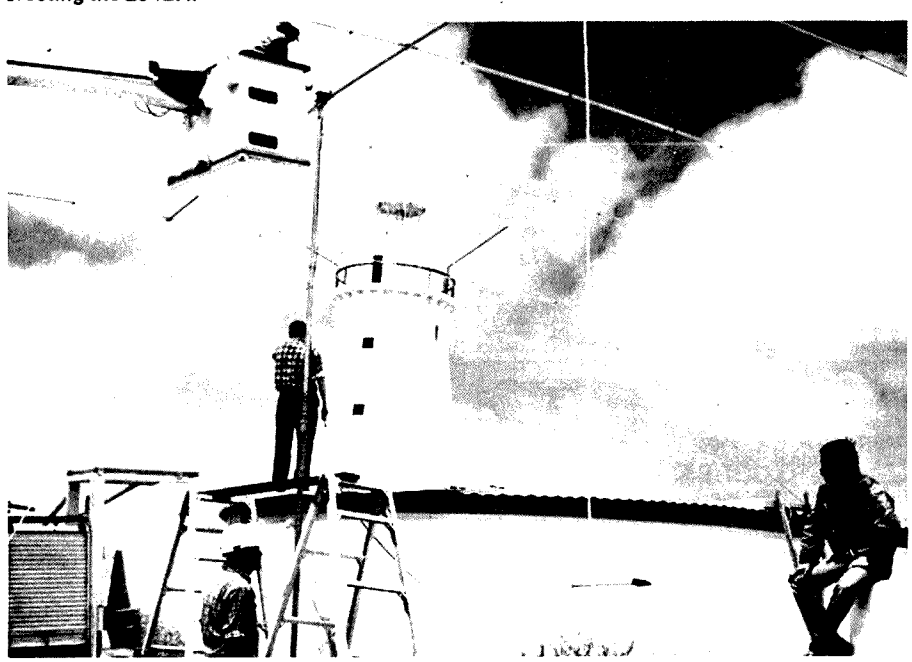
and around the lighthouse.

The antennae comprised a base-loaded wire vertical for 80/160 metre operation, this was 20 metres long, and supported at the top of the lighthouse by a wooden jib. A 40/80 metre trapped dipole hung from the top of the building and sloped slightly to the top of a conveniently positioned flag-pole a short distance away. A 10 element two metre Yagi and two metre J-Pole were erected atop the lighthouse. Lastly, a three full-wave concentric Delta Loop for 20, 40 and 80 metres (the pride and joy of Bob, Alan and Graham, as it had taken the full weekend before departure to construct and tune, with the aid of the 160 feet (48m) high Old Water Tower, home of VK5LZ, the Elizabeth ARC). This was a *gi-normous* array and certainly not an average suburban block construction!

It was during the afore-mentioned activities that the local electricity supply crew arrived, complete with *cherry-picker* in order to replace the troublesome insulator. When they had finished, they acceded the groups request to use the cherry-picker to lift the assembled 204BA onto its roost atop the mast.

With this done, and the power restored, it was time to test the rigs. Graham concentrated operating on 20 metres from the groups quarters, with occasional reliefs from Ron VK5RV. In the lighthouse, three other stations were set-up on the first landing. Communication between the 20 metre station and the stations at the lighthouse was essential and this was achieved by the kind assistance of 15 year-old Kevin, who ran back-and-forth with messages. Two metres was also employed.

The lighthouse bedecked with antennae.



The cherry-picker (top left) in operation erecting the 204BA.

Phil Dent and son Kevin watch Ron VK5RV in operation.

Rena Dent, enjoys the hospitality of the amateurs in return for the hospitality she afforded the amateurs.

It was extremely important to know exactly which frequency each operator was working on, not only so that accidental meetings could be avoided, but also directions could be broadcast as to where the other VK5JSA emissions could e found for more points toward the award. This worked extremely well especially when VK3 stations were contacted on HF as they were told, with certainty, that the VK5JSA VHF operator was currently accessing the Mount William, Mount Macedon, Ballarat or Shepparton repeaters. Distant Victorian repeaters were easily accessed most of the time.

At the end of an enjoyable weekend, Bill and Jack took over the site to allow the weekenders to return to their respective homes and employment. Bill and Jack were to spend a more leisurely six days of operation.

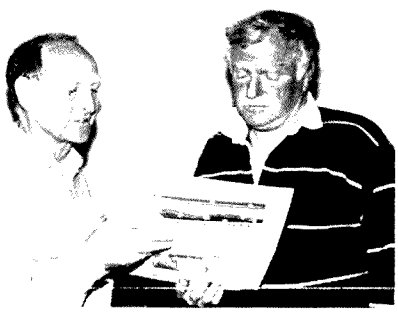
By the time the exercise was over, and considering the poor DX conditions and heavy reliance on 80 metres at night, and 40 metres by day (very little was heard on 15 and even less on 10 metres), the figures were quite good. The whole operation logged 1130 different stations, (numerous repeat contacts were not counted), mostly of a few overs duration.

Of this total, 827 were VKs and 303 were DX and 70 percent (757 QSOs) were made on the weekend in less than 36 hours operating time. There were 38 countries logged with the major contributors being VK; W/K; JA; ZL; VE and I, in that order. All contacts are guaranteed a Jubilee QSL card via the bureau.

One of the targets set for the expedition was an attempt to establish contact with the mayor of Port Lavaca, Texas (the twin city of Kangaroo Island), and have Neville Cordes, Mayor of Kingscote and Dudley at at the lighthouse to exchange greetings and news of their respective area's 150th celebrations. Chuck VK6CF, had earlier been enlisted to have his American friends in Texas and Florida make the necessary arrangements for this meeting at the USA end. However, Murphy's Law stipulated that propagation was to be against such a hook-up. Nevertheless, Neville made the trip out to Cape Willoughby on both the Sunday and Monday, but he finally had to resort to dictating a lengthy message to Chuck for him to relay on his next sched. For all the efforts of Chuck and his

From left: Kevin Dent, Alan VK5ZN (rear), Neville Cordes, Mayor of Kingscote, Bob VK5BJA (at rig), Maree Cordes, Chairman of the Kangaroo Island 159 Jubilee Committee, Rena Dent and George Murphy.

The Mayor of Kingscote in QSO with Chuck VK6CF.



George Murphy of the KI Jubilee 150 Committee presents Graham VK5AQZ with a copy of the Willoughby Lighthouse Jubilee Award. The Award is available for all contacts during the expedition.

Rob Durbridge does his share of the operating.

L to R: Alan VK5ZN, Bob VK5BJA and Peter VK5PRM.

friends, the South Australians send their thanks.

It would be remiss not to thank and acknowledge the many donors of rigs, ancillary equipment and assistance; vis Dick Smith, South Coast ARC, WIA (SA), Wally VK5ACN, Les VK5KLH, the Department of Transport, District Council of Kingscote and Dudley, *The Islander* newspaper, Jubilee 150 (KI), Tourist Information Centre (KI), Peter Koen for display material, the wives of the expeditioners for allowing them to go and to all amateurs who contacted VK5JSA, as their interest made the whole exercise worthwhile.

To all who did work the Cape Willoughby Lighthouse, do not forget to send a QSL card with details of the contact and marked *Lighthouse Award* to: *WIA SA Division, GPO Box 1234, Adelaide, SA. 5001.* Please include $2 towards processing costs to help keep the budget out of the red!

AR

Photographs courtesy Graham Horlin-Smith VK5AQZ on the island and Peter Koen on the mainland.

QSP

UK TO GET SATELLITE TV

Britain has given the go-ahead for three new television stations beaming programs directly into homes from satellites above the Equator.

The Home Office has invited Britain's Independent Broadcasting Authority controlling networks to advertise franchises for the new stations to be on-air by 1990.

The stations will be received using special dish antennas positioned on roofs or in backyards.

SATURDAY REFLECTION

A respected feature of that well-known daily newspaper "The Age" of Melbourne is the second editorial in its Saturday edition, always entitled "A Saturday Reflection". In the issue of 14th December 1985, its author paid tribute to the WIA during our 75th anniversary year. The editorial was so well-informed and complimentary that by special permission of "The Age" we reproduce it here. We apologise for allowing so many months to pass before bringing it to you.

Much of life is filled doing things necessary for living it. But it is enriched for those who make time to associate in voluntary groups having a common interest, and in which they may cultivate friendships and, as in many cases, serve the community.

This observation arises from the circumstance that this year the Wireless Institute of Australia is celebrating its 75th anniversary. The WIA's 8500 members (not to be confused with citizen band — CB users) have trained to be licensed owner-operators of radio stations in the amateur service.

They range from children to men and women of many trades and professions. They strengthen international understanding by conversing from their homes with some of the one million fellow amateurs as far afield as Greenland and Antarctica, the steppes of Russia and the jungles of Africa, and cities of China, Europe and the Americas. Apart from attending meetings, many form enduring on-air friendships and exchange visits with fellow operators at home and overseas.

Through their experimental work many have pioneered developments in radio technology which have benefited the whole of society. The Wireless Institute Civil Emergency Network (WICEN) springs into action whenever called upon in such contigencies as the bushfires on Ash Wednesday, and in the Maryborough and Bright areas this year.

Amateur operators, using battery-powered transmitters when electricity supplies failed, sent first news of the Darwin cyclone and the Mexican earthquake, and maintained communications between Mexico and the outside world, including Australia, until telephone services were restored.

The WIA is, of course, but one of numerous such voluntary institutions. Literally hundreds of thousands of persons make time and use their acquired skills to serve the community in an honorary capacity. They constitute the ranks of bodies such as the State Emergency Service, Red Cross, St John Ambulance Association, Country Fire Authority and scores of life-saving and charitable organisations.

Few societies can have enrolled more "amateurs" in service to mankind than the Church. Its first recruits enlisted by its Founder — himself a carpenter — included no professional ecclesiastics, but were all laymen.

Few writers of the Scriptures were professionals, but they included a sheep farmer, a drink waiter, a taxation clerk, a doctor, a king. The Church's first leader was a "big fisherman". Its first missionary, and writer of much of the New Testament, earned his living as an itinerant tent maker while making converts, organising them into new churches and inspiring them with the ideal of service.

Throughout its history the Church has consisted mostly of laymen and laywomen, serving together with their relatively few appointed leaders.

The ideal of selfless service is worth reflecting on today when society is in tension produced by greed — seen in such action as militant demands for ever less work, ever more pay, ever greater perks, and the "What's in it for me?" syndrome.

The world may salute all those who, outside their normal occupations and without thought of personal gain, volunteer to serve others in time of need.

AR

Thumbnail Sketches

Alan Shawsmith VK4SS
WIA QUEENSLAND HISTORIAN
35 Whynot Street, West End, Qld. 4101

ARTHUR ERNEST DILLON 4CH/4EZ

Arthur Ernest Dillon was active from 1921 to 1927.

Full and just recognition does not always come to those who deserve it. Fate deals with individuals in her own whimsical way, sometimes bestowing immortality on those less worthy than others. The early history of wireless is studded with such examples; Fleming, Lodge, Armstrong, Vail, Popov (to mention a few), who have never rightfully been acknowledged.

In Queensland, many made valuable contributions to the post-WWI state-of-the-art, but their efforts are seldom remembered now. One such person was A Ernie Dillon 4CH/4EZ.

Young Ernie grew up in the old gold mining town of Gympie. It appears that his first professional occupation was with the *Gympie Times* newspaper. After a short stint as a cadet journalist, he turned his attention to wider horizons and took off for the 'big smoke' — Brisbane. During the following six years, A E Dillon was to accomplish more in wireless than many do in a full lifetime of experimentation.

Perhaps his most noteworthy achievement was his *claim* to be the ***First Sound Broadcaster*** in Queensland — 25th July 1921. This was an outstanding demonstration of ability for one so young, as his station was constructed from 'raw' materials only. The event was published in both the *Brisbane Courier* and *Daily Mail*. This brought a response from one or two others, who were similarly engaged, as to the relative success of their tests. Whatever the outcome of these contentions, records clearly show that A E Dillon 4CH, was as progressive as anyone in this area of early broadcasting on the medium wave band.

Brisbane's oldest and historically rich building (convict built in 1827), is the Observatory, Signal, or Windmill Tower. It is undisputed that A E Dillon 4CH, was the first experimenter to conduct MW tests and transmissions from this tower during late 1921, or early 1922. The Tower was ideally suited for this purpose as it *commanded a panoramic* view from Moreton Bay in the east, to Darling Downs on the western horizon. Nearby, he erected a 150 feet (45m) mast and strung an 80 feet (24m) antenna between it and the Tower — the most impressive configuration of its kind in Queensland at the time. Under his direction, 240V AC was supplied. This simplified the problems of power supplies and enabled his tests to be conducted on QRO instead of QRP.

A E Dillon was largely responsible for the formation of the Queensland Institute of Radio Engineers (QIRE) and became its first Secretary/Treasurer. This body claimed to be the *first* of its kind in Australia. The list of Charter Members included the names of some very prominent citizens; vis experimenters, pioneers, academics and business men. Its main aim was to raise the status of wireless 'tinkering' to that of an organised science, with its members willing to assist anyone interested in intelligent research. The Articles of Association of the QIRE are still in existence, but are too lengthy to be included here. The Institute set-up its headquarters in the Observatory Tower, installed its own transmitter and operated under the call 4EZ. The inaugural meeting was held in March 1922, and the first radio broadcast a month later, in April 1922. The *Daily Mail* newspaper reported the test as a phenomenal success: *"Using only six watts, reception of music and voice was logged as far south as Sydney, New South Wales"*. Success indeed!

Ernie then returned to his home town and, with the help of his former employer *The Gympie Times*, called on all those interested to form a radio club. The Gympie Amateur Radio Club came into being in May 1923 — a first for Gympie and another first for 4CH.

Back in Brisbane in October 1923, Ernie participated in arrangements made by the QIRE to demonstrate wireless transmission to the general public. Using 25 watts of power a musical program was transmitted from the Observatory Tower and listened to by an audience of 1000 people attending a concert at the South Brisbane Technical College. This was quite a remarkable display of interest by the man in the street in the 'new fangled invention of wireless'. Yet another successful *first* for A E Dillon 4CH — a telegram was received from Sydney saying reception of the concert was loud and clear.

Before the end of the year 1923, 4CH was involved with yet another wireless interest group; vis the Australasian Radio Relay League. The already well established American Radio Relay League (ARRL) no doubt influenced the formation *of* this body *in* Australia and New Zealand — the aims of both Leagues being basically similar. At the inaugural meeting of the Queensland chapter of the League, A E Dillon was voted into an executive position — more work but also more success for the now very prominent Ernie 4CH.

The Relay League of Queensland (RLQ), a group completely distinct and separate in aspirations from the above-mentioned group, was then founded — and again A E Dillon's name was to be found listed as an RLQ Committee Member. It appears he was also on the Executive Council of another freshly formed society; vis The Radio Society of Queensland.

One might now well ask how he found time to attend adequately to all these various commitments. Besides his 8am-5pm work as an Electrical and Wireless Contractor he conducted broadcasts from both the Tower and his home at New Farm and made himself available as a guest speaker whenever asked. The newspapers and radio magazines of the period were already printing many of his articles and in October 1925, 4CH accepted the position of Technical Editor and Adviser with the newly-formed magazine *The Queensland Radio News*. As with all other aspects of his busy life, his output was prolific. This stay with *the* QRN *can* only be seen as *most* successful.

In retrospect, there is no doubt that the intense activity of A E Dillon 4CH, as an experimenter, broadcaster, administrator and journalist played a great part in stimulating wireless progress in Queensland between the years 1921-1927 and later into the 1930s. It is a pity that so little is now known of him.

At the height of his popularity and success, during the late 1920s, he appears to have dropped his experimental work, put away his very persuasive pen and left the City of Brisbane to take up work in northern and western Queensland. He also married. Fortunately, in his wisdom, he left to posterity a stack of newspaper clippings — stories and articles attesting to his various accomplishments. All these factually place him where he rightfully belongs — one of Queensland's outstanding early wireless pioneers.

A E Dillon 4CH, became a silent key on 24th March 1960, at Brisbane. He is survived by his wife, son Brian and daughter Ernene.

AR

QSP

NO NON-AMATEUR COMPUTERS

The ARRL has refused an FCC *proposal* that would turn the 52-54MHz portion of the six metre band over to non-amateur computer enthusiasts who would use it for data exchange.

RECONSIDER

A US Court of Appeals has ruled that a lower court must reconsider a case between the City of Lakeside and an amateur who wanted to erect a 70-foot tower. The FCC's limited pre-emption policy, while allowing municipalities to make regulations about the height and placement of antenna structures, is emphatic that all such regulations must reasonably accommodate amateur radio.

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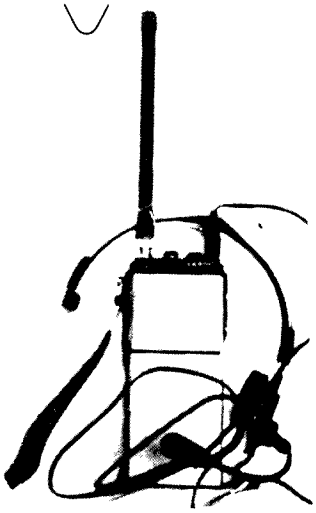

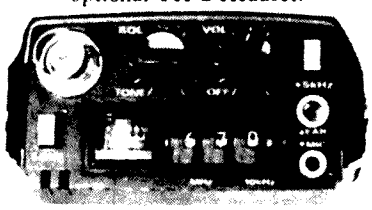

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bail

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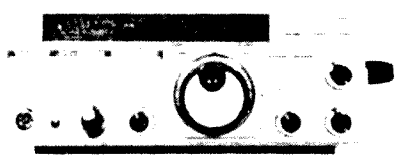
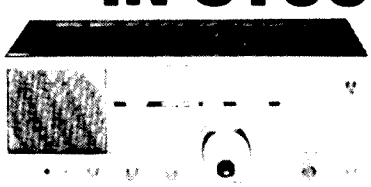


FT-757GX HF ALL MODE TRANSCEIVER



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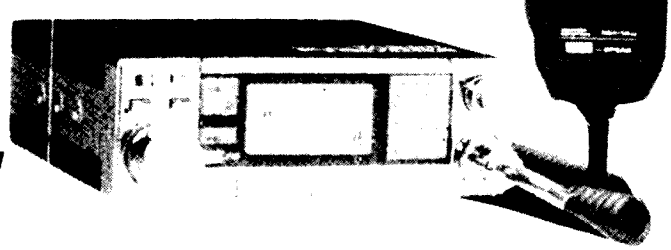
FT270R 2m/25W also in stock



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AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.020	JA6YBR	*Japan*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Japan*
51.020	ZL1UHF	*Mount Climie*
52.013	P29BPL	*Loloata Island*
52.020	FK8KAB	*Noumea*[1]
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*[2]
52.325	VK2RHV	*Newcastle*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.470	VK7RNT	*Launceston*
52.490	ZL3SIX	*Blenheim*
52.510	ZL2MHF	*Upper Hutt*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.465	VK6RTW	*Albany*
144.480	VK8VF	*Darwin*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*[3]
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*[4]
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

(1) A letter from John VK4PU, states he copied the FK8KAB beacon on 11th February 1986. It sends a series of dashes then ***FK8KAB*** *Noumea 6 metres then another set of dashes and then repeats the sequence again. John believes it may be a manned beacon. As soon as it stops, FK8 people spring up around 52.050 like magic.*

(2) (3) & (4) These VK6RTT (formerly Carnarvon) beacons are mentioned as operating under the VHF News heading of the February Newsletter of the North West Amateur Radio Society, at Wickham. The report reads: "The set of beacons, ex Carnarvon, have been refurbished by Graham VK6KAE, and are now on air under the same call sign. The beacons are located at a commercial site near Wickham on a very high hill. Antenna polarisation is vertical with a J Pole being employed for six and two metres and a ⅝ whip for 70cm".

It is good to know this group of beacons are once again operational even if the antenna polarisation is vertical; maybe someday omni-directional horizontally polarised antennas might be installed.

From the same publication: *"In mid-January, Dave VK6YA, worked Perth direct on two metres SSB. Stations worked were Phil VK6ZKD and Bob VK6ZFY. Both stations were heard well in Wickham, but the opening only lasted for seven minutes. Initial contact was established on six metres where signals were steadily rising to the point where Phil suggested a try on two metres, there was no contact on the first attempt but established on the second. In the days preceding this contact, Perth FM station 96FM was heard in Port Hedland, by Mark VK6WV. He tried to key up Perth Channel 4 with 12 watts and suspects he made the distance as he could hear another signal under the Karratha repeater on the same channel which he was keying. With the beacons now in place at Port Hedland and Wickham, we could perhaps look forward to further contacts of this type.*

"Grant VK6KE, from Shay Gap, reports a recent improvement in his two metre set-up and has now been heard on all repeaters from Exmouth to Hedland. He forecasts further improvement with a nine element Yagi to give his 150 watts signal some assistance".

Thanks for the first copy received of your newsletter, boys, please keep it coming. The Editor is Dave Holt VK6YA, PO Box 410, Wickham, WA. 6270, or phone (09) 187 1926.

SIX METRES

After the continued frenzied activity of the first two weeks in January, when six metres continued to show much life with contacts right across Australia and out to ZL and FK on an almost daily basis, conditions changed dramatically for the latter part of January and into February. A number of operators have written with an update to their six metre standings after having contacts with VK9LC and ZM8OY

I was rather intrigued by the last paragraph in the letter from John VK4PU, when he says; *"Subject to completing confirmation, have only 27 countries yet, so hardly worth listing at the moment".* On the contrary, I think 27 countries are well worth listing, being in the upper bracket for VK, and a total I would be pleased to report! Half the fun of having a Standings List is whether you can eventually topple the next above you, sometimes you can work a country the other operator doesn't, so you get one closer. Please send in your list John!

By the time you read this Graham Baker VK8GB, will have taken up residence in Canberra, where I am quite sure he will find six metres very different! He has sent in his latest upgrade of countries worked and there is an increase, but you will have to wait until August to find out. In the meantime, he might just add some more. We wish you well in your new environment Graham, where you will be able to try your skills on two metres and 70cm in a way different from that to which you have been accustomed.

In response to a request from me during a six metre contact, Nev VK2QF sent a resume of the six metre scene from his location at Hargraves, about 200km north-west of Sydney, as well as an update of his six metre standings. As the letter is quite lengthy, some editing has been done, but all salient points are included.

Firstly, Nev comments on the presence of intruders from the north on the band, 52.450 and 52.100MHz, using SSB and on 52.250MHz from the east using FM, all in Asian (JA?) language. Also, on 3rd January 1986, he heard a CW station on 50.185 signing DXF at 0746,with beam heading north — maybe military in Irian Jaya or Timor?

Neville reported a superb six metre season with 348 QSOs. He spent a lot of time calling ZM8OY on CW as he missed the main 11/12 opening. Finally, he got him at 2130 on 27/12, despite an S9 noise level. VK9LC was easy to work at his distance on 23/12 (and other days) at 0311, S9+, using forward-scatter, not back-scatter as the Sydney stations were attempting. Propagation eventually shifted to Sydney and by 0330 most Sydney stations could hear Nev on that day and there-after, as the pattern for contacts had been set. Later, (31/12) Rudi VK9LM, continued to supply the Norfolk Island contacts after VK9LC had closed.

New Caledonian stations were prolific in their contacts, even FK1RF mobile. Ron YJ8RG, also was a consistent contact, particularly as he had increased transmitter power. The P29 beacon was heard frequently, often at the same time as VK4RTL. Nev had some trouble working P29BH, who was usually 5x1, also contacted P29ZEF, but no others.

Nev said he quite enjoyed the Ross Hull Contest, but as before, found the non-contestants reluctant to reciprocate numbers in some cases. He felt the QSO numbers would have been well down, but for the Contest, and enjoyed meeting old friends and swapping numbers and having a general talk. He wants the Ross Hull Contest to continue with consideration given to having a six metres- only section!

Since activating six years ago on six metres, Nev has had 3837 QSOs, including local ones (VK2JH and VK2DDC only), 25 countries, about 900 JAs confirmed, and, of course, 348 QSOs this season *"on a band full generally of good operating practices, comradeship and old friends each year — a perfect combination plus the odd surprise that only six metres can turn on!"*

The following extracts from Nev's log shows the extent of contacts, and this generally would have been the case for many others, particularly in the eastern states, but there appears a lot of contacts were made out of Australia, which shows the state of the band over a period of many weeks.

30/10 VK5ZGC 0903; 6/11 VK5, VK7 0900, ZL3AFN 0817; 8/11 VK8ZLX, VK8TM, VK8KTM, at 1000, mostly S9; 9/11 ZL1BHX 0947 5x2; 17/11 ZL2BPY 0549 529; 27/11 VK9ZB 2304 5x1; 28/11 VK9ZB 0106 5x3, ZL1, 2 & 3 from 0700 plus VK7, VK8GB 529 around 0930.

1/12 VK9ZB 5x9 0504; VK8ZCU 5x3 0722; 6/12 VK8ZLX 2238, P29BH 4x1 2301, VK1VP back-scatter 5x1 2304, VK8ZCU 5x9 1029; 11/12 ZL3NE, ZL1TZA 0900, missed ZM8OY; 14/12 YJ8RG 5x7 2357; 15/12 FK8EM 5x9 2220, ZL2CD 5x7 2226; 16/12 VK3, 4, 5, 7, 8, ZL1, 2, 3 from 0200, VK1 back-scatter (b/s); 17/12 VK7FB 5x9 2237; 18/12 VK3, 5, 7 from 0100, VK2 b/s; 20/12 YJ8RG 5x9 0218 (new PA in use), FK8EM 5x9 0726, FK1RF/mobile 0718; 22/12 FK8AX 419 2242, also VK3, 7; 23/12 VK2XJ b/s 5x5 0157, VK9LC weak b/s, then 5x9+at 0311, ZL2TPY 5x3 0320, VK9LC 5x9 0344 to 0350, no other stations hearing Nev at this time! From 0500, VK3, 5, 2 (on b/s), ZL2, 3, VK8 and at 2046 VK2BA b/s 5x4, ZL2, VK4, 5 to 2230; 24/12 VK5ZEE 5x9 0328, VK2XJ b/s 5x5 0343, then from 0700 VK5, ZL1, VK5ZRO/M, VK4, ZL2, VK6, VK2 b/s, ZL1, 3 and VK7 to 1030, VK2XJ b/s 5x7 2132, VK4ANR 2205, VK9LC 5x9 2222, VK3DU 5x9 2333. A very extensive coverage.

25/12 ZL2BPU 5x5 0713, ZL1, VK5, ZL3, 2, VK7 to 0850, VK1VP b/s 5x1 2101, FK8EM 5x9 2102. FK8AX 5x5 2143, YJ8RG 5x1 2245, VK4FNQ/P 5x2 2256; 26/12 P29BH 5x1 0103, VK4FXX 5x9 0111, FK8EM 5x1 0135, VK7, VK8GB 5x3 0158, VK4ALM 5x9 0610, VK8, ZL1, ZL2 to 1300, from 1850 ZL TV was S9. From 2100 VK8, 3, ZL2, VK1 and VK3 b/s. ZM8OY 2139 5x1, VK4, 2, 5, 7, 4, ZM8OY 519 2252.

27/12 ZL4TBN/3 5x5 0300 SSB and FM, VK6KFD 0913 5x2, VK3, 7, 8. 28/12 VK4, 8, VK2BA 5x9 0338 ground-wave contact, 200km to Sydney, also VK2BKL 5x2, from 2041 to 2307 worked VK1 to VK9 and ZL1 to ZL4, also P29BH 5x3 2320. (That's quite a haul for less than three hours! . . . 5LP). 29/12 From 0000 VK3, VK7, VK2YVG 5x9 0020 at Broken Hill, short skip, VK6, 5, 8, 4 to 0636. At 2209, VK2BHO 5x9, VK9LC 2220, FK8AX 599 2256, FK8EM 5x9 2300. 13/12 YJ8RG 5x5 0141, VK9LM at 0147, ZL2, VK8, 4, 6, ZL2, VK5, 1, ZL3 to 0815. Also worked Andy VK6OX at 0303 5x9 +30 for the strongest VK6 ever heard, then VK6OX worked VK9LM and ZL2TPY!

1/1/86 P29ZEF 4x1 0220, VK6, 8, 4, ZL2 to 0900. 2/1 VK1AA 5x1 0102, VK8ZCU 5x9 0113, VK4, VK2YVG again from Broken Hill 5x9 0742, VK5, 4, ZL2, VK3 to 0919. At 2103, ZL2CD 529,

ZL1ADP 5x1 2311. 3/1 From 0236 VK4, 7, 8, VK9LM 5x9 0307, VK6OX 5x7 0322, FK8AX 5x9 0333, VK5, 2 b/s, 4, 3, 7. From this point onwards the band started to taper off, some more openings each day, especially 5/1.

What can be gleaned from the above is the wide coverage with swings from VK4 to VK6, over to ZL, then perhaps FK8, back to VK4, a few more VK6s, then VK5, 7 and so it goes on. The ZLs were very consistent.

LORD HOWE ISLAND

Whilst I would prefer to distance myself from the original problem associated with QSL cards from the DX-pedition by Nev VK4ZNC, to Lord Howe Island where he operated as VK9LC, and later left equipment for Rudi VK9LM, to continue the operation, I cannot because my column carried the original request by Nev for a nominal donation of $5 for a QSL card. (Page 42, December 1985, AR).

After the success of the expedition, in which more than 200 six metre contacts were made, the flack began to fly around the country when those seeking QSL card for their contact found they were indeed being asked for $5. I believe Nev, when he says the fee was in an effort to offset some of the costs of the expedition rather than to make a profit, but many felt they were being held to ransom and were very vocal in their objections and steps were being taken to have the matter investigates at official levels.

I wrote to Nev outlining my objections to what he was doing. After initially refusing to change his mind, Nev did eventually agree to provide QSL cards for both VK9LC and VK9LM without any fees, in return for a SASE, and, in fact, I already have received my cards.

Depending on your viewpoint, you may or may not agree with what has transpired. I believe Nev did the right thing by changing his mind and that he did not really see the implications of his first moves. Generally speaking, VKs are somewhat notorious when it comes to supporting what can be a well intentioned expedition or similar, although they have come to the party on some occasions, so I assume Nev thought the money was the best way to overcome the problem.

I now hope everything will quickly return to normal without any recriminations towards anyone. If anyone wants to send a donation towards costs after recovering their QSLs, then this is a matter for them to decide as it will be quite different from paying for a QSL. Whatever the final outcome, Nev has indicated he will probably make another expedition to ZM7 or ZK2 at the end of 1986, for another new country on six metres.

DJ5CQ/VK9LM

A matter quite unrelated to that above has been brought to my attention by the receipt of a long letter (photo- copied) from Hans J Rueckert, c/- Trader Nicks, Lord Howe Island, NSW. 2898, which tells the sad story of a series of disasters which have befallen Rudi, formerly VK9NM/LH, and VK9LM since 4th December 1985, and holder of DJ5CQ in Germany. The writer of the letter is a SWL on Lord Howe Island.

Rudi was making his second expedition to LHI and was mainly centred on the HF bands, 80 metres in particular. (Hence I sent a copy of the letter to the HF DX editor, as it could concern the HF fraternity more so than VHF operators). Up to December 1985, more than 12 000 contacts had been made on all bands in both CW and SSB.

Briefly, due to various storms, Rudi lost four 80 metre antennas before one was made to stay up!. On 6th November, Rudi complained of being unwell and finally SWL Hans took him to the doctor, who diagnosed a serious illness which eventually required a RAAF medical team, with four doctors and staff, to come to the island 700km from Sydney, in a Hercules aircraft. Within an hour, a complete operating theatre had been set up in the three bed hospital and a successful life-saving operation had been performed on Rudi, who on 10th November was taken to a hospital in Sydney by the RAAF team. He spent four weeks recuperating, before returning to LHI.

On 6th January, Rudi's mother was admitted to hospital with a serious illness and his wife, on the return journey, had a minor accident due to ice on the roads. However, one of the worst blows was the receipt of a message on 8th January, via VK2BZW, that on the night of 6th January his building, which included his home base DJ5CQ radio shack, all his equipment and QSL cards was burned to the ground. The bungalow had just been built and in his haste and excitement to return to LHI, Rudi forgot to insure the building.

It is a sad twist of fate that after Rudi giving 30 000 contacts on two expeditions, should now, on returning home, have nothing. The small community of 270 people on LHI have already subscribed $250 to help the rehabilitation process. If anyone would like to assist this fund I would be happy to pass contributions direct to Germany for Rudi.

BRIDGING THE BIGHT ON 3.5GHz

Reg VK5QR, has sent me details of the latest efforts between himself and Wally VK6WG, in Albany, on 3.5GHz.

"The initial contact occurred on 25th January 1986, between 1300 and 1400UTC when reports were exchanged on 3.5GHz. Both were 539. At 0730 through 0755, on 26th January 1986, we were again in contact for 25 minutes. This time I gave Wally 569 (peaking to S7) and he gave me 559. The signals remained audible for some time after we returned to 70cm.

"Wally was using a 3-4 watt amplifier, built by Andy Furlong WA2FGK. This was driven from a 19.064MHz crystal oscillator into a Microwave Module tuned to 384MHz into a tripler to 1152 through a filter to another tripler (VSE66M) to the amplifier via another filter. The antenna was a four foot (1.2m) dish fed with dual horn 3,5 and 2.3GHz. His receiver was home built with a pre-amplifier.

"Here at VK5QR, I used a similar crystal oscillator (I built them both and sent one to Wally) into a MM Module tuned to 384MHz, then on to an amplifier to about 20 watts into a tripler to 1152, about 12 watts through a filter to another tripler (VSE66P) to 3456MHz at possibly 2 watts through another filter to a 10 foot (3m) dish fed with a log periodic for 1296, 2304, and 3456MHz. Receiver set-up the same as Wally. The secret for success would appear to be first and foremost, a common frequency, secondly Wally had a little power amp and thirdly my dish.

"Once we established contact on 2304 it was a simple matter for me to turn the dish exactly on Wally and to net the two frequencies by tuning the crystal slug in the MM. Thus we had common 1152 drivers and by listening to the third harmonic on our 3.5GHz receivers we knew just where to look. So effectively did this system work that I heard Wally switch on his transmitters! ! ! First try! !

"The future? ? ? Maybe 5.7GHz if we can get the diodes."

Congratulations to Reg and Wally for the establishment of a **World Record** for the 3.5GHz band. Distance is 1885km or 1171 miles. These contacts add another page to their achievements for the distance which has now been bridged by them on 52, 144, 432, 1296, 2304, and now, 3456MHz. Quite an effort . . . 5LP.

THE MICROWAVE BANDS

Des VK5ZO, has been in touch to say that following my request three months ago for those interested and/or operating on the microwave bands to get in touch with Des, no one has done so!

Des is certain there is some 10GHz activity at least in all States, even VK8, where Neil VK8ZCU has equipment for that band, but no one to work! In fact, VK3KAJ and VK3ZBJ recently had a contact over 90km on 10GHz and are trying to achieve 200km.

If you have microwave equipment, please let Des know as he would like to compile a register which, in turn, might lead to an increase in interest and activity. His address is: *Des Clift VK5ZO, 5 Netley Road, Mount Barker, SA. 5251.*

AURORAL CONTACTS

A strange set of conditions prevailed on *Sunday,* 10th February (actually 9/2 by UTC time) at 2155, when Doug VK3UM, carried out a scatter check on 70cm and found aircraft enhancement signals to Gordon VK2ZAB, in Sydney, were weaker than normal, around S2. At 2212, the aurora started with garbled SSB and strange CW signals. Most activity centred on 144MHz. David VK3AUU, alerted me by phone and on firing up *found* VK5NC, in Mount Gambier S9+, but barely readable, VK5ZDR and VK5RO, who normally are barely discernible with those beam headings were equally as strong. These three, plus VK5ZPS and VK5NY, made the going very difficult due to the area of the band they were occupying. I heard VK2DDC, VK1VP, VK3AUU, VK3AUG, VK3AOS and another VK3Y. ? ?, but was unable to work any, mainly I guess, because of similar local QRM at their locations.

VK5NC worked VK2ZAB, VK2XJ and quite a few others. VK3UM worked VK1BG and others. VK7,'G, VK7ZOO and VK7ZJG, at least were on from Tasmania, others included VK3KEG and VK3AUU, who apparently worked VK7JG, on 70cm. It appears there were a lot of other stations on from Melbourne, but I could not hear them from here. Some auroral signals were still being heard in Melbourne as late as 0100. At VK5LP, the signals were gone by 2230 or soon after.

Such activity does not happen very often at our latitudes, but gave an indication of how spectacular contacts could be made and which we read about occurring with some regularity in the UK and Europe. All this added some cream to the cake after all the enhanced two metre activity of the just completed Es season.

MOONBOUNCE FOR EVERYONE

The heading appears in December 1985 *QST, The World Above 50MHz* and is over the photograph of the *slightly large array* at W5UN located south of Houston, Texas. Here are some of the details:

"The slightly large array *consists of 32 specially built KLM 17LBX Yagis with 75ohm feed-point impedance. The H frame is constructed from 97 feet (29m) of Rohn-25 tower with eight 40 feet-long (12m) crossarms, each holding four of the Yagis. The array is dual point mounted, with the main pivot mast being rotatable. Both masts are about 30 feet (9m) high. Actual azimuth rotation is accomplished by turning the rear wheels on the mobile platform (an old Ford pick-up chassis), which holds the moving mast. The mobile platform travels on a circular, non-tracked, dirt pathway The array requires almost an acre for full rotation, 360 degrees of rotation takes about 6.5 minutes.*

"Early tests with the array indicate that it is performing about as was predicted. The main power lobe (E plane) beamwidth is about 3.75 degrees wide. The H plane beamwidth is about 6.5 degrees wide. Good noise readings are being obtained from the sun and other extra-terrestrial sources. The first weekend on the air resulted in working about 40 stations on random calls via the moon.

"I am hearing my own echoes using an IC251 without any pre-amplification and with a single Yagi antenna. Average equipped stations should be able to hear me if they point their antennas towards the moon. I call CQ a lot on 144.008MHz on weekends, beginning on my moonrise when the moon is in northern declination. Stations running 160 watts or more and using a good antenna such as the Cushcraft Boomer or KLM 16LBX should be able to get enough power to the moon for me to hear them. For stations which cannot elevate their antenna schedules will have to be on moonrise or moonset when they aim toward the moon".

That Dave's creation is working I can testify as I have now heard him at least 12 times during EME weekends, etc. In view of his comments regarding 160 watt stations, I may be tempted to give him a call from VK5LP one day.

THE ROSS HULL CONTEST

A few comments are reaching my desk about the Ross Hull Contest, hopefully there will be some more soon. Most are commenting on the seeming reluctance of some operators to give numbers. These may be newcomers who do not understand what it is all about or those who are not happy with

the present rules and are resisting participation anyway. Nevertheless, it is being spelled out that the loss of the Contest would see a dramatic drop in interest on the VHF bands during the Es season.

Whatever you think, let me hear from you and send in those scoring tables, the more we have the better to judge where improvements can be made.

50MHz STANDINGS

The 50MHz Standings as published by Bill Tynan W3XO in November's *QST* are interesting in that the top place is now held by VE1YX with 77 six metre two-way confirmed countries, second place goes to JA4MBM with 76 countries, then follows K8WKZ with 71, K5FF 69, VE1BNN 68. There are just over 330 call signs listed overall, and the list now includes those nominated in the Australian list from Amateur Radio, which was headed by David VK2BA at the time of printing. I note that Bill decides his positions by the number of countries claimed, whereas, I prefer it to be determined by the countries confirmed. Just a matter of how you see it, I suppose.

GENERAL NEWS

I have received an interesting screed from John Allen VK5UL, giving an outline of his activities on the five metre band before WWII and leading on to his radar involvement during the war. It is a bit long to include this month so I will let you read it next month.

As a result of my contact with Chris ZM8OY, on 16th December 1985, I have now received his QSL which says that Raoul Island, in the Kermadec Group is an active volcano with up to six quakes a day, most of which are never noticed. It is mainly covered by the Nikau Palm, the home of the colourful Tui bird.

January 1986 *CQ ham radio* from Japan (via VK6RO), TVQ0 video on 46.250MHz was heard in Japan on 14 days during October and November; ABMN0 — six days; ATV0 on 19/11; ZL TV on 20/11, and VK6OX was worked by JA1VGN on

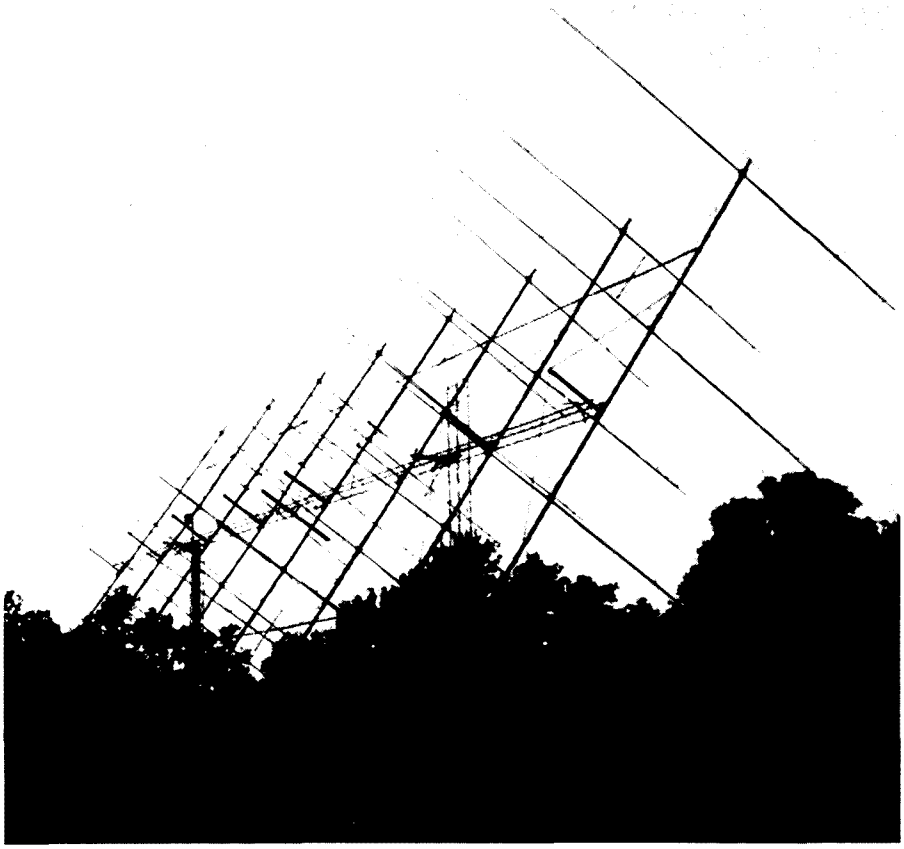
Dick Norman VK2BDN with 10GHz FM transceiver mounted behind a 40cm dish with 28dB gain.

23/10. So it seems signals still cross the equator occasionally.

Last month I mentioned the exploits of the VK2 10GHz gang. This month I include a photograph of Dick VK2BDN, with some of his equipment.

Closing with the thought for the month: *"A smile is a curve that can set a lot of things straight"*. 73 The Voice of the Hills.

AR



Photograph courtesy QST magazine

The large array at WSUN.

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

As DXers, quite a number of us become very complacent regarding our hobby and consider the lure of DX is the only facet of the privileges that our license allows us.

This fact was brought home to me recently when I attended an open day at the Victoria Police Training Academy. This display, which is becoming an annual event, is used to serve two main purposes — to attract recruits and as a Public Relations exercise depicting many of the aspects of the police departments that are used to detect and prevent crime. The organisation was a credit to all participating squads who had spent many hours in preparation. VK3s should look out for it early next year.

After viewing many of the exhibits, it was interesting to note the popularity of communication-orientated working displays and particularly the interest shown by the younger generation in the teletype, FAX, two-way communications and computer orientated sections. These are said to be the most up-to-date and best police communications in the Southern Hemisphere.

As amateurs, we have all these interests and more at our fingertips and the problem is how we can introduce it to the younger members of our society. I am sure that if it was more widely promulgated by individual members and we had the facilities to stage an open day of such magnitude or maybe join another organisation that was doing a PR display, in our WICEN capacity, our increase in studies and the issuance of licenses would be dramatic and form the basis of a career in electronics for many.

CALL BOOK INTEREST

Much interest has been shown by members, both in Australia and overseas, who obtained the 1985/1986 Call Book with the cover depicting the massive antenna system which belongs to Ian VK3MO. The system seems to be capable of receiving and putting an S9++ signal anywhere around the globe.

I have discussed the interest shown with Ian, and of course I have asked him about an article for AR, but Ian feels that he would like to do some more work and tests on the system before giving an article to this magazine.

Ian (as well as others), is still working on the project, and conducting innumerable tests with his all home-brew equipment which was detailed in January 1983 AR page 23. For those amateurs who have not read the article or have just joined the Institute, Ian uses three-four element Yagis at 14, 29 and 43 metres above ground. The tower is fully rotatable using a chain drive located at ground level and supported by 38mm polyester rope attached to bearings at the three levels.

The beams were designed by W0OKC for 14MHz and scaled to 440MHz by Dr Jim Lindsay, of the Denver Research Institute, where they were compared with others on an antenna range, altered and rescaled up to 14MHz. Ian's objective is that with the use of his home-built computer, when he taps in 'G' the antenna rotates to the best path and automatically alters the antenna phasing for the best signal by sending out a short burst of coded RF every minute during the QSO to maintain optimum reception to both parties. The ideal would be have a similar set up at each end.

A PROMISE

Next month, I will present an exclusive interview with Jim Russell VR6JR, who has shared an island of tropical paradise with its 64 inhabitants for a period of eight months, whilst working on a special project. Jim made time to work nearly 12 000 contacts. Do not miss this interesting interview.

TOGA

Sal IT9AZS, after his Sao Tome operation of S90AS, has been signing 5V7AS and it appears he has company, according to some reports. The company includes two other amateurs Enrico IT2RLX and Fernanda, who is a YL. All QSLs go to IT9AZS.

Ron 5V7RW, who is missionary, will be returning to the USA around the end of July.

160 METRES

During the CW-WW 160 Metre Contest Don G3XTT, worked 51 countries, heard another 11 and notched up Worked all Continents in eight-hours.

Paola I2UIY, in one-hour and 34 minutes on the 10th January, worked 45 W and VE stations. *So what* many may say; but Paola was only using a 430S to an inverted 'Vee' at 13 metres to the apex.

Akito JA5DQH/NN7S, showed up from Macau late last year. Akito is recognised as one of the top operators using this band. He holds 160 Metres DXCC and on this occasion WAC was obtained in just two days of operation from Macau. I think yours truly will migrate to that band, when time permits!

DISAPPOINTMENT

From a number of overseas sources, it appears that there is no interest in our hobby in South Yemen. There is no club, SWLs or anyone interested in the privileges we enjoy, including the authorities. It appears that all the inhabitants within the borders of 7O have more important things on their minds in their day-to-day life and it will be a long time before we hear any genuine resident station signing from this area. What a pity! Yet it has been activated — read on . . .

SOUTH YEMEN ACTIVATED

This heading may prompt readers to say I am trying to pull an April Fool's Joke, but this column is based on fact not fiction.

During recent and very necessary evacuations at short notice, Alain 6W1HB, was caught up in handling traffic. During a lull in the messages to the vessels anchored at a safe distance off-shore Don VE3HGN, got a TU2 to alert Alain to a contact on 14.103MHz at 1800UTC, 18th January.

Congratulations Don, but I will be surprised if it will add to your DXCC tally.

Apparently, it looks grim as to hopes of an accredited operation as many plans have been jeopardised by different factions in that part of the world of late, though keep listening. The impossible has happened before and caught many unawares. Lee KH6BZF, has a saying *'expect the unexpected . . . and the expected'*. Thanks Lee, and I wish that I shared your optimistic approach, philosophy and quick wit.

PIRATES

This unfortunately seems to be becoming a regular feature of this column, however it's felt that the readers should be made aware of such operations.

The members of the 4U1VIC Club are not happy with the flattery of being so active — they are receiving cards when they were not even on the air!

It appears the call was illegally used on 5th May 1984 (21MHz), 13th/25 and 26th June 1984 (14MHz), 8th November 1984 (3.5MHz), 31st March 1985 (14MHz) and 8th May 1985 (14MHz). These dates have been based on cards received.

My personal opinion is that someone has very little to do that they have to resort to using a rare call to get QSOs or is it just one or two people that have acquired equipment and are just being pestilent, even to the degree of causing deliberate QRM to this stations authentic transmissions, going as far as to playing their own transmissions back to them. It appears that in this case 'small minds have access to big equipment'.

TEN MHz

Bruce 3A0GB, has been quite active on this WARC band. I would be interested to know how many DXers have migrated to this band. For that matter reports of activity on all WARC bands from enthusiasts would be appreciated.

ANTARCTICA

Angel WA2VUY, has written an excellent precis of the LU and CE allocations in the Antarctica, which was printed in QRZ DX and is reprinted for readers interest.

Angel, firstly points out some things to remember.

(1) Always ask the operator for his or her EXACT location, eg The name of the base, the specific island, the island group, latitude and longitude. (This would not be recommended to be done in a pile-up of eager stations thought, otherwise a lynching party may appear at your doorway with your feedline . . . VK3AH).

(2)Note that few countries issue call signs for the Antarctic Region that enable DXers to distinguish between the different DXCC 'countries'. As a matter of fact many operators make no distinction between, lets say, the South Shetland Islands and the Antarctic Continent. As far as the operators are concerned they are located in Antarctica, and that is cold enough for anyone!

(3)Argentina assigns the letter 'Z' as the first letter of the SUFFIX of stations located in the Antarctic Region. Prefixes heard or worked include LU1Z— through LU5Z— and AZ5Z—; the call sign AZ1A appears to be a new combination, and an exception to the rule.

(4) Chile assigns the CE9 PREFIX to stations in Antarctica. For the amateur the suffix is meaningless.

(5) Note that more than one island comprises the South Sandwich Islands, South Shetland Islands and South Orkney Islands. South Georgia is singular, as in Antarctica.

Angel, has gathered the following information from maps, QSLs and similar documentation and suspects that it may still contain some inaccuracies, therefore any documentation that would confirm that this list is incomplete would be appreciated by Angel direct or via your scribe who will gladly pass the information on.

ARGENTINA

SUFFIX	BASE NAME	LOCATION	COUNTRY/NOTES*
1ZA	Destacamento Naval Orcades	Laurie Island	*S Or. Also AZ5ZA*
1ZA-B	Base Teniente Matienao	(see 2ZD)	*Ant*
1ZB	Destacamento Naval Isla Melchior	Palmer Arch	*Ant*
1ZC	Destacamento Naval Deception	Deception I	*S Sh*
1ZD	Base Gen San Martin	Grahamland?	*Ant*
1ZE	Estacion Cientifica Almirante Brown	Puerto Paraiso Bay	*Ant [1]*
1ZF	Destacamento Naval Bahia Esperanza	Trinity Peninsula	*Ant [1]*
1ZG	Base Gen Belgrano 2	Coats Land	*Ant*
1ZI	Estacion Cientifica Teniente Jubany	King George I	*S Sh [2 6]*
1ZL	Destacamento Naval Ellsworth	Ellsworth Station	*Ant. Also 4ZZ*
1ZM	Base Esperanza	Trinity Peninsula	*Ant [1]. Also 1ZF?*
1ZR	Destacamento Naval Petrel	Dundee I	*Ant [3]. Also 5ZR*
1ZR-M	Base Esperanza/Cabral	Trinity Peninsula	*Ant [1]. Also 1ZF?*
1ZV	Base Esperanza	Same as 1ZM	. . .
1ZW	Base Gen Belgrano 2	Coats Land?	*Ant. Same as 1ZG?*
1ZX	Base Gen Belgrano	Filchner Ice Shelf	*Ant*
1ZZ	Base Cientifica Alferez Sobral	Filchner Ice Shelf	*Ant [4]*
2ZB	Base Primavera	Grahamland	*Ant. Near 1ZE*
2ZD	Base Teniente Matienzo	Near Larsen Inlet	*Ant [1]*
2ZR-M	Base Gen Belgrano 3	Berkner I?	*Ant*
3ZR-M	Base Sobral	Filchner Ice Shelf	*Ant. Same as 1ZZ?*
3ZY	Estacion Cientifica Corbeta Uruguay	Morrel Island	*S Sa [5]*
4ZS	Base Aerea Vicecomnodoro Marambio	Snow Hill Island	*Ant*
4ZZ	Destacamento Naval Ellsworth	(see 1ZF)	. . .

CHILE

PREFIX	BASE NAME	LOCATION	COUNTRY*
CE9	Base Antarctica Arturo Prat	Greenwich Island	S Sh
CE9	Base Antarctica Teniente R Marsch	King George Island	S Sh
CE9	Base Ant Presidente Frei Montalva	Nelson Island	S Sh
CE9	Base Ant Bernando O'Higgins	Trinity Peninsula	Ant

Notes: 1 Grahamland, 2 King George 1 and is also known as 'Isla 25 de Mayo', 3 Joinville Group, 4 At the foot of the Argentina Range, 5 Thule Group, 6 LU3ZI and LU5ZI are operated from the LU1ZI location.

** ARRL DXCC country abbreviations: Ant = Antarctica, S Sa = South Sandwich Island, S Sh = South Shetland Islands and S Ork = South Orkney Islands.*

ARUBA

Bob KQ2M, made in excess of 12 500 contacts during his short stay. He is adamant that it should become a separate DXCC country and has documentation to submit that will prove it. I may yet be proved wrong in my prediction about its new country status.

ILLEGAL OPERATIONS

It appears that a number of C53. ./MM call signs have appeared on the bands. The Gambian Licensing Authorities, along with many other authorities DO NOT ISSUE licenses that can be used for maritime or aeronautical operations. In fact there are only two legitimate EL Maritime operators to my knowledge.

TRAVELLING

Ghis ON5NT, a very keen DXer as mentioned in a special article last month, has successfully completed the Advanced FCC examination and has the call sign AA4OI. He is travelling around CX, LU and CE, and hopes to obtain a license to become QRV from these locations — and I hope to get a story for this column.

OGASAWARA ISLANDS

The island is presently activated by the Tokyo University Amateur Radio Club *under* the call *of* JA1YWX/JD1. All QSLs to JA1YWX or JM1LPN.

DX CLUBS LIST

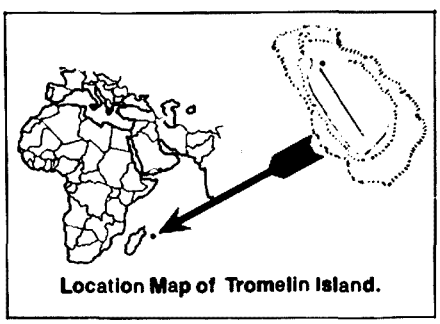
Bob W5KNE, Editor and Publisher of QRZ DX, is compiling a list of ALL DX clubs and would appreciate details of any you know or belong to. Bob will make the list available to all requesting the information when it is completed.

TROMELIN ISLAND

This is one of France's many tiny possessions that shows up as a dot on a map of the Indian Ocean, has become a weather station and is located about 400km off the north-east coast of the Malagazy Republic.

This fauna and flora sanctuary is about one and half kilometres in length, sand covered and scattered with bushes.

The island is administered by the Prefect of Reunion Island and there is a small airstrip that is used for transportation of the rotating of meteorological crews from other outposts such as Juan de Nova, Europa and Gloriosa.



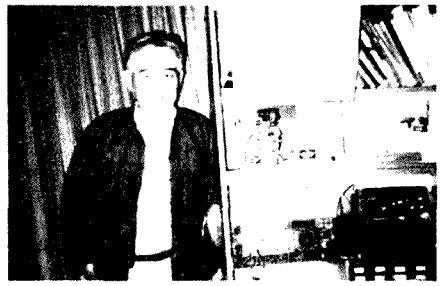
Location Map of Tromelin Island.

ANDAMAN ISLANDS

Deena VU2HMD, who operated from this rare country last June appeared again in January. Apparently there is a transceiver installed in the Andaman Beach Resort Hotel, however no authorisation seems to be forthcoming, so give it a miss as regards a QSL.

TAIPEI

A lot has been said of late about Feng BV0DA, ex XW8BR It is interesting to note that logs in various forms, due to the intrepid operating habits Feng had to use before he fled the country, are obtainable from Massy JH1ARJ, for the next three months then the logs will be returned to Feng.



Feng in his "shack" with his new call.

MARRIED IN INDIA

Shanthina VU2GO, well-known to DX operators world-wide, became a married woman on 21st August 1985. The monotone reproductions depicted do not do justice to the colourful pictures supplied of the wedding but are reproduced for the benefit of her many friends in this country.

BITS AND PIECES

GB2SDD was the special call for St David's Day. QSL to GW4HOQ. * * Note the QSL information for Rudi VK9LM, is now via DJ5CQ or OE1ZL. SASE or two IRCs on an AIRMAIL endorsed envelope. * * 4K1J, quite active on 40 metres CW. The two operators that have surfaced so far are Vic and Slava, and they advise to QSL via UQ2GAG and UA1BJ respectively. A big signal on CW, could it be from the main transmitter and/or its associated antenna system? * * Have patience — Joe W3HNK, a gentleman 53 years young and a QSL Manager for 23 years with 225 amateurs in his stable, has a broken QSL report writing arm. Get it in order soon Joe. Good luck in your convalescence friend. * * V3DA was John W3UM. All QSLs to the home call. * * BY4RN is quite active and has acquired a beam and linear! * * Watch for St Pierre et Miquelon. Ralph hopes to operate from this location from around the first week in July for a short period. * * It is sad to note the death of well-known DXer Tom K3TG, an instigator of getting the station 4U1VIC established. * * Ed, operating as VP5EE, has been quite active on the low bands. Others from the call areas of 5H3, 5N0 and 5T5 have also been quite active. 5H3 has been represented by 5H3s CE, HM and VB. JR8BUU/5N0, YU3KI/5N0 and DF3IT/5N7 have been holding the 'fort' in 5N0, whilst Lothar 5T5SL has been flying the flag for Mauritania. * * 9J2LM, is purported to be a pirate. Wait and see is the advice. * * TV5SDP and TV6SDP were operating from a telecommunications exhibition in Saloon-de-Provence during late February and early March. * * TV6BFI is a special call sign allocation presently in use until the 30th June to commemorate the bicentenary of Marc Sequin, a French engineer of note who lived from 1786-1875. * * A DX net to listen to on 14.212MHz from 1400 to 1530UTC is under the control of SV1PL and EA6BR. * * Joe OD5BP is occasionally active from Lebanon. * * Wolf Y39XO, is active from the German Democratic Republic using the call of Y61Z on 1.821 or 1.831MHz from 0300 until his sunrise. * * The eighteen resident amateurs on the Galapagos Islands have formed a radio club and there are hopes to get them DX-orientated and provide many with a new DX country, as it is still high on the wanted list in many countries.

THANKS

Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-OSO, DX FAMILY FOUNDATION NEWSLETTER, INSIDE DX, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, NEWSLETTER OF THE VIENNA INTERNATIONAL RADIO CLUB, ORZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, cqDX, JA CQ, JARL NEWS, KARL NEWS, OST, RADCOM, VERON and WORLDRADIO.

Members who have contributed include VKs 2HD, PS, EBX, 3YL, 4AIX, 6HD, NE and G3NBC. Overseas amateurs include AH2BE, G1EOD, HI6LC, KB6OAW/KH2, ON7WW, WB8GFJ and ZLs 1AMM and AMN. Thanks to one and all who have made this column possible.

QSP

50TH ANNIVERSARY

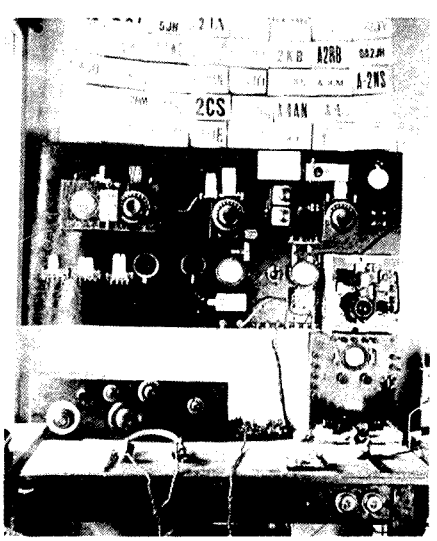
This year will mark the 50th anniversary of the radio society, Radio Amateur du Quebec, the CQ Worked All Zones Award and the 6L6 beam-power vacuum tube. Happy anniversary to all three.

75 AWARD RECIPIENTS

The following radio enthusiasts are recipients of the WIA 75 Award.

CERT NO	NAME/CALL SIGN
459	A B Bryson ZS2OM
460	Michael Sciacca VK2PSP
461	Wilfried Lohnert DL4GBA
462	Gunter von der Ley DJ6NI
463	Wilhelm Schneider OE3WQB
464	Robert Kaegi HB9KL
465	Manfred Vogt DJ2MN
466	Jean-Michel Huard F6IFE
467	Robert Graumann OE6GRG
468	Josef Feistauer DL3FD
469	Heinz Gobbels SWL DE1HGA
470	W A Donald VK7NRV
471	Georg Mirus DL1MM
472	Felix W Serr DJ6LQ
473	Ursula Rummel DK8GE
474	H Jans Fauzy YB6MF
475	Sigeo Isizaki JA1SVV
476	Sigeo Isizaki JO1RTJ
477	Sigeo Isizaki JA1TGU
478	Sigeo Isizaki JR1BLX
479	Brian Kirkby VK6NKB
480	Marvin W Alnutt W7AGE
481	R Bedford VK3BPG
482	R C Milne VK3KEL
483	Darren Hibberd SWL
484	Eike von Stillfried KJ2KA
485	Rolf Wanke DK2MH
486	Carl Huether KM1H
487	Greg Bateman VK1BAT
488	Mike Garrison KB6EXI
489	G Visser VK7DQ
490	L K Collier VK2VZB
491	Rainer Tuschen DE1RTA
492	Ad Mens PA3CYX
493	Helmut Hoffmann DJ7EV
494	Tadashi Magai JR1BLX
495	Paul Tams VK2PMN
496	Dennis St Ruth VK2EMF
497	Ron Hollywood VK4ARH
498	Bill Fanning VK3DWF
499	V Hearne VK3CQP
500	M Harris VK4NIF
501	Paul Peacock VK2PPP
502	Wally Morphett VK7WX
503	Murray Bloomfield VK3DOV
504	Mick Schmidt VK5BVM
505	Reg W Ross VK3YD
506	Wilton P Wells VK3PAL
507	Ernst Keil SWL OE1-3045
508	Hans Mey DL5KP
509	J F Hanran VK4JH
510	Peter Marmet HB9DCZ
511	Harold E Burt KJ9O
512	Michel Krideras SV1RK
513	Kazumi Ueda JA3EDD
514	Dennis L Miller G4UCB
515	Ewald Schulte DL4JL
516	Janti Silman YD0MGM
517	Harri Ludolph DL4FBZ
518	Neville Spry GW4KGR
519	Mavis Stafford VI3KS
520	Eng George Craiu YO3RF
521	Con Carlyon VK4BID
522	W J Cross VK2BCW
523	George Shuttler VK6OQ
524	Kevin Jones VK4AKI
525	Russell E G Smith VK5KAK
526	Keith Sherlock VK2WQ
527	T A Allen VK7AL
528	Stuart Fairbairn VK2AYF
529	W G Shakespeare VK2AGF
530	Bruce R Bathols VK3UV
531	Gary Carroll VK3DOM
532	Gary R Baker VK6NRA
533	Harley D Anders Jnr KD7UH
534	H W Patterson ZL3TKX
535	Simon Anderson VK3KRL
536	J A Patterson VK2CJP
537	Roger D Harrison VK4MKY
538	Craig Cook VK3CMC
539	Steve Reeves VK2CSR
540	Frank D Barsanti VK2FDB
541	Bill Rice VK3ABP
542	Tony Mowbray VK2KAJ
543	Lindsay Collins VK5GZ
544	Terry N Pearson VK7KF
545	Dennis Scragg VK5NMS
546	John Bennett VK6RI
547	Max Hardstaff VK7KY
548	C K Williams VK3NCW
549	Tony Williams VK2DJW
550	W L Stevens VK4YN
551	G Hume VK2VR
552	Stewart Dick VK4NII
553	Giorgos Gexas SV1SL
554	Spyros Himakios SV8CS
555	Giorgos Antonopoulos SV8RX
556	Mixalis Krideras SV1RK
557	John Hempel VK5SJ
558	John Hempel VI5SJ
559	John Hempel VI5JSA
560	J A (Bert) Cusick VK3MQ
561	Helene Dowd VK7HD
562	B D Clark VK4KU
563	G Kaska VK3CGK
564	John E Daluas YB5NOF
565	Christina Soelistyowati SWL YC0GKK
566	David J McAulay VK3EW
567	Jeanette Ramsey VK2CJF
568	K M Wilmott VK2FKW
569	Hans-Jurgen Baumann DL5IC
570	Gunter Rohleder DL9NBR
571	Gerald Katz 4Z4ZZ
572	Zdenek Laznovsky OK1DZL
573	Alois Baumann DL2KBS
574	Svein Henriksen LA3PU
575	Tibor Erdos-M HB9CVT
576	D R (Max) Raicha 5Z4MR
577	S Nagayama JR2PAU
578	Haruhisa Yamagami JA1BND
579	Demetrios Diamandidis SV7NW
580	Kosta Kalaitzides SV7LO
581	Wilhelm Kohout OE3OU
582	E F Davies VK6ED
583	J S Svendsen VK3NJS
584	Paul Kehoe VK3KPK
585	M Smirnow VK2NKN
586	John Goldfinch VK4FNQ
587	Neil Watt VK3XNW
588	
589	Takashi Magata JE3JBM
590	Darren Mitchell VK2PXO
591	Stan F Porter 7Q-001
592	Conrad A Thompson N7DUO
593	John Hempel — WIA SA Div for VK75A
594	Chin Pak Kooi 9M2CW
595	Werner Becker DK9KE
596	Werner Becker-Fritz EA8OR
597	Kenton A Dean S79WHW
598	Eleanor McGrath VK4BEM
599	Jean Beaudreault VE2EDL
600	Steve Lamb W9NUF
601	John Alcorn VK2JWA
602	J C Kemp VK5PXK
603	H J Masefield VK3NXQ
604	Nancy Baker VK2NPG
605	S Bush VK7EQ
606	A T Webb VK2UC
607	Steve Millington VK2ENB
608	R S Watkins VK6XV
609	Stephen Martin VK3DQL
610	Bev Hebiton VK6DE
611	Paul Walenski DF3EN
612	Sandeep M Kacharia VU2RGA
613	Franz Hennig DJ9HF
614	Claudine Hennig DL2HAC
615	Bernhard M Bohme DL9NCC
616	Moch Sidarta YB0BWI
617	Herbert Heinje DL8BAS
618	Herbert Heinje Jorg DL9BBQ
619	Herbert Heinje Adolf DK7BV
620	Jack Small ZL1KQ
621	Conrad R Canterford VK3PHW
622	Victor Martinelli 9H1V
623	Andrew Leach VK5ALF
624	A L Poore ZC4AP
625	Laurie Pritchard VK4BLE
626	Willy Vogel HB9CUW
627	Shigemitsu Ganda JA8MPV

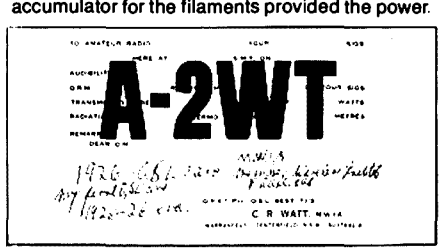
Congratulations are extended to all recipients.



MID-20s ERA

The accompanying photograph features the shack of OT Russell VK2WT. Above the equipment, many QSL cards from past amateurs of the period can be seen. Many call signs will be familiar to Old Timers, no doubt.

Russell's first valve equipment was a two-stage oscillator, push-pull amplifier using UV201 valves, a detector receiver using a UV200 soft valve and a UV201 amplifier. The period was around 1925-26. High tension B batteries with a six volt accumulator for the filaments provided the power.



VK2WT's first QSL card — 1925-26.

"... When I was studying for my amateur ticket, I found that everything I understood was irrelevant!" — VK2COP

— VK2COP

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

APRIL

5- 6	*WW SSTV Contest*
9-10	*DX-YL to North America YL CW*
12-13	*IBM QSL Party*
16-17	*DX-YL to North America YL SSB*
19-20	*ARCI QRP Spring CW*
26-27	*Swiss Helvetia Contest*

MAY

3- 4	*County Hunters SSB Contest*
10-11	*USSR CQ-M Contest*
17-18	*Michigan QSO Party*
17-18	*ARI International Contest (Rules this issue)*
24-25	*CQ WW WPX CW Contest (see below)*
27-26	*1986 CLARA AC/DC "Mystery" Contest (Rules March issue)*

JUNE

21-22	*1985 VK Novice Contest (Rules will appear in May issue)*

I had not included the CQ WW WPX SSB Contest in the Calendar for 29-30th March. I trust that this will not inconvenience anyone. I do not claim to provide an exhaustive list of contests for each month and, in fact, I only try and provide as good a guide as possible as to what is on.

The rules for the CQ World Wide WPX Contests are the same as for last year, see page 43, April 1985 issue. It would serve little purpose to repeat them again since they are well established world-wide. Following are a few points to keep in mind.

The duration of these contests is from 0000UTC on the Saturday to 2400UTC Sunday. Only 30 hours out of the 48-hour contest period may be used by single operator stations. Off-times can be taken in up to five periods. Multi-stations can operate for the full 48-hours.

The QRP section has become very popular and it is worth your attention. The definition of the prefix multiplier is spelled out in detail and is not to be confused with the interpretation used by the CQ WPX Award program. Also, bear in mind that stations in call areas different than that indicated by their call signs are required to sign portable.

The multiplier is determined by the number of different prefixes worked and is counted only once, regardless of how many times it is worked on other bands.

Another point to keep in mind is that, in the multi-operator, single transmitter category, only one transmitter and only one band may be used during the same 10 minute period. Picking up a new multiplier on another band during the same time period is definitely prohibited.

An alphabetical/numerical check list of claimed prefixes is a requirement and must be included with your log.

An updated trophy and plaque awards list now shows over 40 awards, so it could well pay to be in there competing. Deadlines for logs are 10th May for SSB and 10th July for CW. Be sure to indicate SSB or CW on the envelope. All logs to be posted to: *CQ Magazine, WPX Contest, 76 North Broadway, Hicksville, NY. USA. 11801.*

I am indebted to Frank Anzalone W1WY, for the comments supplied regarding the CQ Contests and also for the other contest material which he provides me on a regular basis.

You may note the complexity of scoring for some of the overseas contests and then you perhaps will form an opinion to the effect that the rules for contests originating here in VK are not so complicated after all.

REMEMBRANCE DAY CONTEST 1985

Well, as indicated by the announcement in last month's issue, the gremlins were really active in connection with the publication of the details and results of the Remembrance Day Contest, which appeared in February's magazine. At times it may appear that one has a system and that it is working well, however, as in this case, let just one sheet of paper become mixed up in the pile and a disaster may ensue. I would hesitate to describe the problems which have arisen as a result of such a happening as actually being a disaster as the mistakes made can be corrected, still, such is most embarrassing and I certainly offer my apologies to all concerned and in particular, to the members of the New South Wales Division. I also apologise most profusely to the VK1 Division and offer my wishes that they will try again in the Remembrance Day Contest and gain the success which they would wish for. Now, without further ado I will now provide amended details of results which were incorrect and list those logs which were omitted.

VK2 High Frequency Section A (Phone)

C'SIGN	SCORE				
KL	*628*	*ZL*	*365*	*ARQ*	*207*
BFR	*571*	*BAM*	*353*	*AMU*	*206*
DCL	*521*	*AGF*	*304*	*BTP/P*	*205*
ANO	*494*	*PS*	*285*	*CZX*	*204*
BQ	*487*	*PD*	*221*	*RX*	*202*
DVU	*440*	*BQS*	*220*	*NW*	*201*
DYW	*412*	*DQP*	*210*	*AOA*	*199*
EJW	*390*	*WI*	*208*		

It is necessary that the Divisional Scores be amended with the inclusion of the logs listed above, as well as additions to the VK6 Divisional Score to include VK6YF — 105 points, HF Phone; VK6EB — 28 points, HF Phone; VK6EB — 60 points, VHF Phone.

The number of licensees listed for each Division was not correct with a major discrepancy occurring in connection with the VK3 figure. Other amendments are: VK7JE with 90 points operated HF CW and the call sign VK3CCG in the HF CW Section should be amended to read VK3CGG.

AMENDED RESULTS — REMEMBRANCE DAY CONTEST 1985

The formula for the determination of results for each Division is: Total Points/Total Divisional Licenses multiplied by Weighting Factor.

VK1 — 5369/307 x 1.08 = 18.88
VK2 — 12600/4825 x 7.81 = 20.395
VK3 — 14189/4473 x 5.96 = 18.90
VK4 — 6602.2492 x 5.83 = 15.44
VK5 — 16666/1749
} x 1.31 = 11.46
VK8 — 122/170
VK6 — 12552/1414
} x1.26 = 11.58
VK9 — 519/8
VK7 — 2871/569 x 1.27 = 6.408

NOTE: VK8 points and license totals are added to VK5 and VK9 points and license totals are added to VK6.

Licensees per Division are as follows:
VK1 — 307; VK2 — 4825; VK3 — 4473; VK4 — 2492; VK5 — 1749; VK6 — 1414; VK7 — 569; VK8 — 170.

The corrected figures for percentage of licensees submitting logs in the contest are:
VK1 — 14.3; VK2 — 1.92; VK3 — 2.28; VK4 — 2.68; VK5 — 749; VK6 — 6.79; VK7 — 3.87.

In producing these percentage figures I have done so this time using the actual number of entrants in the contest, as against the number of logs submitted. I feel that these figures may be useful when an overall look is taken at the final results of the contest such as I proposed in my report to the Federal Convention in 1985.

I had promised previously that I would provide details of comments from entrants in this contest. Almost without exception they indicated general satisfaction with the contest although some did suggest minor changes to the rules. Here are some examples:

Had a marvellous time sharing VK75A in middle of a contest. Of particular interest was the contact of VK75A with VK3WIA — VK4BPI.

The proposal is as follows — that Western Australia, for the purpose of contests such as the RD Contest, be divided up into two parts; eg north and south of the 26th parallel to enable contact points to be made between the two zones — VK6MY on behalf of the Peel Amateur Radio Group.

The RD Contest is a little different to the others in that it is the friendly contest — VK3KFI.

I do appreciate being able to submit a receiving log — L30371.

The contest from Christmas Island was hard work for the three operators, as om 40 and 80 metres we could hear all the mainland states but could not break through their high noise levels — VK9XZ.

May I preface my comments by saying that I realise, regardless what you do with the rules, you will never please everyone — VK6PV.

However, I would like to see a two-hour, instead of three-hour break on VHF — VK6YF

Congratulations on the setting out of the rules in July AR — best they've been for a long time. Thanks — VK8WZ.

In a small community where there are only six or eight dedicated VHF operators . . . it is not easy to make a minimum of 25 contacts — VK6DM.

Thanks for bringing the club calls back into the RD — VK6HU for Scout Radio VK6.

The one point — one contact rule has shown to disadvantage those in remote areas . . . I'm sura that if my QSO was worth more than a "local" QSO some effort would have been made to pass numbers — VK6KY.

Congratulations on the best organised RD Contest for a considerable number of years — VK6AR.

My first attempt at a contest with my full call . . . found out why it's called the Friendly Contest — VK6ATE.

Let's get back to the idea of promoting QSOs between as many call areas as possible by awarding multipliers for the number of call areas worked per band — VK6AOU.

The separation of HF from VHF was a good idea — VK6ED.

VHF and HF categories. I think this is a very good idea . . . differential points. I have never enjoyed the HF section since the different points were abolished. When VK4 was worth five points and ZL six points, there was much striving to contact the rarer stations. I would like to see the differential points return — VK6FC.

The present rules seem to be reasonable enough and the separation into categories and sections is a good idea — VK4YG.

Am delighted with the new rules which make HF and VHF two separate categories. The HF rules, in my opinion, are great, however, you were a but tough, I feel, on the VHF section by only allowing contacts three-hourly Surely now the sections are split it doesn't matter how far apart they are, I would suggest one hour is fine providing the categories stay separate — VK5FF

Please could consideration be given to giving a higher score to contacts to non-neighbouring states to encourage people to work weaker stations — VK5YO.

Have been in every one except 1975, when I was overseas — VK5RK.

VHF should come down to two-hour repeat period . . . I do not advocate the original one-hour period — VK5EA.

I found the going on 80 metres was extremely difficult, in fact the worst I have ever encountered with almost continuous QRN — VK5ATN.

This time it is Certified Mail — VK3AH.

The rules themselves were quite acceptable and if not changed would suffice for the future — VK3BRZ.

Two hours between contacts, this I feel would have given us a better result on VHF — VK3BGS for Moorabbin and District Radio Club.

As always, I enjoyed the RD, but lower activity does reduce the interest — VK2BHO.

Enjoyed the spirit of the thing . . . did not have occasion to find fault with anyone's operating procedures . . . good fun . . . think the silent keys to whom we dedicate the contest would have been pleased — VK2COP

I would appreciate if you would consider as last year, a two-point score for CW for the 1986 contest — VK2DQP

If the handicapping is done correctly, not only should all the call areas finish with the same totals, but every contestant also will tie for the only place — VK2BOS. (Jim's letter contained a great deal of other useful comment. Don't want to contemplate such a radical rule change, Jim. 5QX).

If the ZLs made an effort by being more active, would it be possible for them to win the trophy? — VK2ANO. (Oh! No, John, No. 5QX).

The XXX is a new rig and I found the selectivity a bit disappointing — or is a signal 1kHz away asking too much? — VK2KL. (Depends how strong it is Ian. 5QX).

The use of dual call signs should be encouraged as it meant more points for other stations hence encouraged more participation — VK1KAL, President VK1 Division.

Incorporate at the beginning of the rules a list of names and call signs of those men and women we are to remember — VK6WT.

Why not keep the scoring to four points to ZL, five points to P29? Like the rules previously — VK5MX.

I enjoyed this contest better than last years, but I still feel the time between VHF contacts is a little too long — VK5KCI.

A novice in the north-west would possible have a hard time making 20 contacts under present conditions — VK6PF, WA Divisional Secretary.

One letter recently received points out a most unfortunate incident. I quote from this letter in such a way as not to identify the offending station in a public manner.

I thought you might like to hear why a log was not entered by myself . . .I listened o the 'XXX Divisional Broadcast and before the completion of the "Last Post" VKXXX was off and onto his second contact . . . Having been taught in the Army during WWII to remain silent until the "Last Post" had finished, I immediately, in disgust I might say, packed up my sheets, turned off my set and forgot all about the RD Contest for 1985. XXX's actions show that he has lost sight of what "Remembrance" may mean to some people . . . Far be it for me to 'make a mountain out of a molehill', but, to me, his actions leave much to be desired — VK7NGH.

I agree whole-heartedly with Greg's sentiments and cannot help but say that it is always saddening to see an increasing general lack of respect in this in this day and age for some of the higher values which should be cherished.

I would like again to commend the majority of operators who submitted logs of quite reasonable standard in this Remembrance Day Contest.

Congratulations to all those who took part and particularly to the VK2 Division members who participated despite little support from their compatriots. A letter from the VK2 Division Federal Councillor queried the fact that only one VHF log was listed for that Division. I can assure you that only one log was submitted In that category which met the required minimum number of contacts.

I have also received several letters from operators from the VK2-area whose logs were among those not listed in the top 23 shown above. With only one exception, the letters were polite to a point and I do appreciate the kindness of those writing in the way they have been considerate even when they may have suspected I had made a mistake. I will endeavour to reply to these letters as quickly as possible. Based on my experience in this Remembrance Day Contest, I will be considering a few possible minor rule changes, as well as adopting a slightly different method of dealing with ail the logs. This should be a case of third time lucky and having gained all this experience, I will then find that it will be my last Remembrance Day Contest as Federal Contest Manager.

RESULTS FOR 1985 ROSS HULL MEMORIAL VHF/UHF CONTEST

The overall top scorer is Les VK3ZBJ.

This year there has been a reasonable increase in the number of logs submitted for this contest. There were 11 competitive logs accepted, four check logs and one log which was, unfortunately, not acceptable in the form presented. However, it is quite obvious that this contest is not well supported and I wonder just what one has to do to bring about some reasonable increase in interest. I would point out quite clearly, that all claims of interest and participation are completely nullified when the Contest Manager still sees only a mere handful of logs submitted. The matter must be looked at with the consideration in mind that there are many, many other stations who can operate on the VHF bands and upwards. There has been some insinuation that the Federal Contest Manager does not understand what goes on at these frequencies. This I publicly refute insofar as an understanding of VHF, UHF and microwave is concerned as it is in this region I spend a great deal of my time working professionally. Together with the logs, I have received a reasonable amount of comment from those who did enter. Most of the comment is obviously meant to be helpful, however a small percentage of same is both elitist in nature, as well as being insulting. I suggest that the amateur ranks have traditionally refused to accept the elitist approach, thus I will take little notice of such an approach. I am sure that we are mostly proud of our tradition to give even the newest amateur a fair go and a helping hand.

As the FCM, I am responsible to the Federal Council, via the Executive, for my actions and I naturally follow WIA policy in carrying out my allocated duties. Should anyone have strong feelings on such matters as not only this contest, but any of the WIA sponsored events, I would suggest that you work through your proper channels as a member of our national body and contribute to informed discussion via the democratic forums of our organisation.

So much for my 'soapbox' treatment, but sometimes such comment is necessary. The various suggestions worthy of consideration contained in the correspondence received will be carefully considered when both submitting my annual report to the Federal Convention and when trying to solve the problem of even further modification to the rules of this contest. Having said all this, I now provide a listing of log details.

SECTION (I) PHONE — all bands

CALL SIGN	PERIOD AND POINTS OVERALL	7-DAY	2-DAY
3ZBJ	*7942	2763	821
3YMP	3699	1401	*441
3KAJ/3	3171	*1439	421
8ZLX	*2114	887	266
3ATN	1679	1011	329
3AUU	1606	782	250
5LP	*1129	764	229
1ZAR	*547	361	139
4JTW	*282	212	64

Check logs were received from VKs: 3ZXY; 4PU; 5ZO and 7ZAP.

SECTION (III) 52 and 144MHz only

2QF	*1626	913	308
3YRP	*67	—	67

The asterisk * indicates a certificate winner. Certificates are awarded to the highest overall score in each state and for the highest seven-day score In each state. In Section (III) both the highest score and runner-up receive certificates. No entrant may receive more than one certificate.

A log was submitted by VK3ALK, but was not accepted due to not being correctly laid-out; vis no listing of scores for each period and without a cover sheet as required by the rules.

The neatest log that I have seen in recent contests was submitted by VK3YMP. If there was a separate award for the neatest log of the year, he would certainly have earned it.

Not the least of congratulations for his extremely large score for yet another year goes to Les VK3ZBJ. I will be arranging for the certificates to be produced as soon as possible.

Well, that is it for another month. I hope that my corrections and other work done for this issue will be pleasing to a majority of our readers. For now 73, Ian VK5QX.

ARI ITALIAN INTERNATIONAL CONTEST

This contest is conducted from 1600UTC, Saturday 17th May 1986 to 1600UTC, Sunday 18th May 1986 (every third full weekend of May).

World-wide amateurs must contact Italian stations including San Marino, Vatican City and SMOM.

CLASSES — single operator CW; single *operator* SSB; single operator mixed mode; multi-operator single transmitter; SWL. Multi-operator stations can use both CW and SSB.

BANDS — 28; 21; 14; 7; 3.5; 1.8MHz. Italian stations are allowed to use 1.830-1.850MHz on 160m and 3.613-3.627 and 3.647-3.667MHz on 80m for SWL participants.

EXCHANGE — RS/T and QSO number beginning with 001. Italian stations will send RS/T and two-letters (Province; ie 599MI, 59VE, etc)

QSO POINTS — Four points for every QSO with an Italian station. The same station can be contacted on the same band once on CW and once on SSB.

MULTIPLIERS — One multiplier for every Province per band and San Marino, SMOM and Vatican City are additional multipliers.

FINAL SCORE — The sum of QSO points from all bands multiplied by the sum of the multipliers from all bands.

Logs — Must contain date; time in UTC; band; mode; call sign; report sent; report received; QSO points and new multipliers. Please use a separate log for each band. Include a summary sheet with your call sign, class of participation, QSO points and multipliers on each band and final score. The usual declaration that the rules of the contest have been followed is required. Do not forget your full address, your equipment description and your comments. Logs to be posted within 40 days from the end of the contest to: *Giorgio Beretta I2VXJ, via Sciesa 24, 20135 Milano, Italy,* or to the *Contest Manager, c/- ARI, via Scarlatti 31, 20124 Milano, Italy.*

PENALTY — Logs without a summary sheet and a declared score will be used as check-logs. A declared score of five-percent more than the actual score will mean disqualification.

AWARD — Special awards will be issued to the top five of every class of participation. A certificate will be awarded to the top scoring operators in each country and for each category.

WAIP — The Worked All Italian Provinces is issued to all amateurs for contacts with 60 different Provinces. This will be issued upon a written application in the logs, and a separate list of QSOs for the award. A QSL card is not required for a Contest QSO. The cost of the WAIP Award is 10 IRCs.

COMMONWEALTH CONTEST

Participants in the Commonwealth Contest are reminded that the deadline for receipt of logs in the UK is 14th April 1986. (See January AR). Awards of medallions will be made to the top-scoring VK amateur and to the state team of four who gain the highest aggregate score.

AR

LZ DX CONTEST

The Bulgarian Federation of Radio Amateurs invites amateurs world-wide to participate in this contest.

The contest is held on the first Sunday of September, from 0000 to 2400UTC.

Frequencies to be used are 3.510-3.560, 7.000-7.040, 14.000-14.060, 21.000-21.080, 28.000-28.100MHz — CW only.

Categories: A — Single operator all bands; B — single operator one band; C — multi-operator/club station all bands only; D — SWL.

Exchange RST and ITU zone of the transmitting station.

Scoring: Each confirmed QSO with a LZ station — six points. One point for QSOs with stations in the same continent. Three points for all other QSOs. One station may be worked only once per band.

Multipliers: The sum of the number of ITU zones on each band.

Final Scoring: Sum of QSO points of all bands multiplied by the final multiplier.

SWLs score three points for two call signs and two numbers; one point for two call signs and one number.

Logs should be in standard form with separate logs are required for each band. A summary sheet showing zones worked on each band and a declaration are required. Logs should be posted, to Central Radio Club, PO Box 830, Sofia 1000, Bulgaria, Europe, not later than 30 days after the contest and the post-mark will be decisive.

Medals will be awarded to the top *three* scorers in each section.

Participants in this contest may apply for several Bulgarian awards when submitting their logs. See Awards column for rules of these awards.

VK1XX, with a score of 810 points, was a Continental Winner in this contest in 1984. VK3ANZ and VK4XA were participants but did not receive a placing.

AR

EXPO 86

Following are ticket prices for Expo 86 for visitors who may be in Vancouver during the duration of Expo. Tickets include free admission to the 80 pavilions, plazas and theatres on site. Visitors can also ride the monorail, two skyrides and an intra-site ferry system without paying anything extra.

Season pass, until 1st May 1986 $139 — 2nd May to 13th October $169.

Three-day ticket $39.95 to 1st May — 2nd May to 13th October $45.00.

The above are adult prices, children 6-12 and over 65 years are half-price.

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton. SA. 5014

Here in VK5, we are celebrating the 150th anniversary of the founding of South Australia, and in particular, as already announced, there is an award for working the required number of VK5 stations during 1986.

On the other side of the world, the Zurich Division of the Union of Swiss Short Wave Amateurs (USKA) is celebrating 1986 as the bi-millennium of the town of Zurich, with a special certificate named the *Zurich — 2000 — Award.*

This award is available to any licensed amateur (or SWL), who, during the year 1986, works (or hears) the required number of stations in the canton of Zurich. Australian stations are required to work/hear four stations, two of which must be in the actual town of Zurich. The club station HB9Z counts as two contacts. Claim is by log extract only, no QSLs required, to be certified by two licensed amateurs, with the fee of SwF5 or US$3 or 4IRCs to: UKSA Sektion Zurich, Awards Manager, Fritz Zwingli HB9CSA, Eugen-Huberstr 25, CH 8048 Zurich, Switzerland.

AUSTRALIAN DXCC LADDER as at 31st December 1985

Number of current countries: 317
Number of deleted countries: 52 *shown as / after the current countries score.*

Those members whose keys have become silent since the last ladder was published are listed with their final scores.

Overseas members are included in brackets.

PHONE SECTION

315/49	Jim Rumble VK6RU
315/43	Tom Mulder VK6MK
315/34	Bram Jellett VK5AB
315/31	Keith Schleicher VK4KS
314/47	M Millowick VK5MS
311/17	Robin Lyon VK6LK
311/10	Gil Moody VK4AK
310/14	Ken Chiverton VK4VC
310/13	Fred Lubach VK4RF
309/20	Col Wright VK7LZ
309/11	Mike Bazley VK6HD
307/24	Austin Condon VK5WO
307/15	John Heine VK3JF
306/15	Bill Verrall VK5WV
306/10	Neil Penfold VK6NE
305/35	Bill Hempel VK4LC
303/40	Ray Baxter VK4FJ (SK)
302/5	Ken Jewell VK3AKK
302/4	Peter James VK3AWY
300/4	Syd Upperton VK2DFE
299/14	Laurie Werner VK5XN
299/13	Geoff Wilson VK3AMK
299/4	Hugh Spence VK6FS (SK)
295/4	Steve Gregory VK3OT
294/18	Arthur Johnston VK4PX
294/5	Frank Beech VK7BC
293/1	Jim Joyce VK3YJ
292/5	Ray Miller VK3RF
291/3	Gillian Weaver VK6YL
290/15	Charles Taylor VK4UC
289/23	D Kiesewetter VK2APK
288/4	Stephen Chamberlain VK6IR
288/2	I G Haworth VK6IH
286/5	Andre Everts VK7AE
283/2	John Woodings VK6AJW
281/27	Noel Hanson VK2AHH
281/11	Ron Glasson VK4BG
279/5	Peter Cosway VK3DU
279/4	John Nakulski VK3BLN
279/2	Rowland Bruce VK5OU
275/16	Cardle McQuillan VK3ACD

CW SECTION

310/43	Frank Hine VK2QL
306/33	Austine Henry VK3YL
300/45	Ray Baxter VK4FJ (SK)
299/31	Ivor Stafford VK3XB
293/24	Fred Lubach VK4RF
292/34	Reg Ross VK3YD
260/15	Mike Bazely VK6HD
279/31	Col Wright VK7LZ
278/25	D Kiesewetter VK2APK
277/21	Mavis Stafford VK3KS

OPEN SECTION

315/49	Jim Rumble VK6RU
315/43	Tom Mulder VK6MK
315/39	Keith Schleicher VK4KS
314/43	Austine Henry VK3YL
314/10	Gil Moody VK4AK
313/36	A Sharland VK4SD
312/18	Mike Bazely VK6HD
311/35	Col Wright VK7LZ
311/30	Fred Lubach VK4RF
311/19	Mary-Ann Crider (WA3HUP)
310/23	John Heine VK3JF
309/47	Ray Baxter VK4FJ (SK)
308/29	Austin Condon VK5WO
306/15	Bill Verrall VK5WV
303/31	Ivor Stafford VK3XB
303/4	Frank Beech VK7BC
302/5	Ken Jewell VK3AKK
301/22	Arthur Johnston VK4PX
300/4	Hugh Spence VK6FS (SK)
299/13	Geoff Wilson VK3AMK
298/4	Steve Gregory VK3OT
296/32	D Kiesewetter VK2APK
296/3	Ruthanna Pearson (WB3CQN)
293/16	Chas Taylor VK4UC
288/14	Ron Glasson VK4BG
287/43	Jack Anderson VK3JA
283/4	John Nakilski VK3BLN
278/35	George Luxon VK5RX
277/30	Noel Harrison VK2AHH
277/10	David Portly VK4DP
275/16	Cardie McQuillan VK3ACD

MAJOR MITCHELL AWARD

In Amateur Radio, January 1986, Joe gave details in this column of the Swan Hill District Radio Club's *Major Mitchell Award,* but at that time the art-work for the certificate had not been completed. It is now available and is reproduced this month. The certificate is 21 x 29.5cm, and has a red design with black lettering on buff paper, about 170gsm.

SWAN HILL DISTRICT RADIO CLUB VK3BSH—VK3RSH

Major Mitchell Award

SWAN HILL 1836 150th ANNIVERSARY 1986

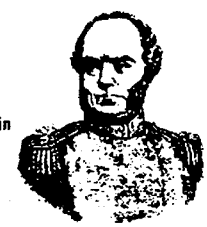
AWARD No: DATE

This is to certify that

Sample

has submitted the required proof to attain this award.

Club President Awards Manager



Major Sir Thomas Mitchell 1792-1855

In 1836 Major Mitchell started on a journey from Sydney to a point on the Murray River near the South Australian border. After exploring the area, the next part of the expedition was to travel upstream along the Western banks of the Murray. On the 20th day of June, 1836, Mitchell and his party camped on a sandy rise, covered with native pine trees, close to the river. That night Mitchell was kept awake by the noise of waterfowl, mostly black swans. The next morning Mitchell wrote in his diary: "I therefore named this isolated and remarkable feature Swan Hill . . ."

TASMANIAN AWARDS

Details of these awards were published in AR as follows:

Tamar Valley Award — November 1984
Worked All Tasmania Award — December 1984
Reproduction of WAT certificate — April 1985

If you do not have access to these, please write and I will send you a copy.

By courtesy of Bob Richards VK7NAI, following is a list of the recipients of these awards to the end of 1985.

Worked All Tasmania

1	VK7NAI	80m/SSB	15	VK2NQM	80m/SSB
2	L30037	80m/SSB	16	VK2PKT	80m/SSB
3	ZL1AQO	80m/SSB	17	VK2NAN	80m/SSB
4	VK2KFV	80m/SSB	18	VK1BAT	80m/SSB
5	VK7NAX	80m/SSB	19	VK2BMH	HF/SSB
6	VK2JBM	80m/SSB	20	VK7NBF	80m/SSB
7	VK2PZC	80m/SSB	21	VK1MV	HF/SSB
6	VK3DMZ	HF/SSB	22	VK7NCP	80m/SSB
9	VK1ZL	HF/SSB	23	VK2DJJ	80m/SSB
10	VK7NAI	Nov/80m	24	VK2PXS	80m/SSB
11	VK3PYB	80m/SSB	25	VK2AKP	HF/SSB
12	VK7BD	80m/SSB	26	VK3DVF	80m/SSB
13	VK3PXC	80m/SSB	27	VK2NPJ	80m/SSB
14	L40018	SWL/Open			

Tamar Valley Award

1	ZL1AOO	80m/SSB	9	VK2PKT	80m/SSB
2	VK2KFV	80m/SSB	10	L40018	SWL
3	VK2CKW	80m/SSB	11	VK1MV	HF
4	VK7NAI	80m/SSB	12	—	
5	VK7BD	2m/SSB	13	ZL2259	SWL
6	L30037	SWL	14	VK2NAN	80m/SSB
7	VK2JBM	80m/SSB	15	VK2NPJ	80m/SSB
8	VK2PXS	80m/SSB	16	VK3CQP	80m/SSB

J 150 AWARD NETS

Effective 1st April 1986, the following changes have been made to the list published in February's AR.

40 metre phone: Mondays 7.086MHz at 0400UTC.
20 metre phone: Tuesdays 14.186MHz at 1200UTC.
20 metre phone: Fridays 14.286MHz at 1200UTC.

Also, please note the following additions:
160 metre phone: Daily 1.828MHz at 1000UTC.
160 metre CW: 1.806MHz. This channel is monitored daily, with frequency CQ calls when band conditions are favourable.

WORKED ALL ZONES AWARD sponsored by CQ magazine

This award is available to all licensed amateurs. The official representative of the CQ magazine in Australia is Doug Jones VK3NDY, 21 Sanday Street, Glen Waverley, Vic. 3150, from whom further information may be sought, and to whom all QSL cards must be sent for checking.

EX-SERVICE AWARDS

Last month, details were given of the award

program of the Royal Naval Amateur Radio Society. I subsequently sought corresponding information from the brother/sister organisations, the RAF Amateur Radio Society and the Royal Signals Amateur Radio Society. The quick answer is that the RAFARS and the RSARS awards are only available to members of the respective societies. So the first step, if you are eligible, is to join. The respective addresses are: *Administration Secretary, RAF Amateur Radio Society, Royal Air Force Locking, Weston-super-Mare, Avon, BS24 7AA, England* and *Mr A W.W.Timme G3CWW, 287 Gillroyd Lane, Heights, Linthwaite, Huddersfield, HD7 5SY, England.*

AR

BFRA AWARDS*

Six attractive certificates are available from the Bulgarian Federation of Radio Amateurs to amateurs world-wide for two-way contacts or SWL reports on all bands/all modes.

Applications of a GCR list of claimed QSOs verified by two licensed amateurs, or the local club authorities specifying stations worked; date; time; band and mode, together with a fee of 10IRCs should be sent to the Central Radio Club, PO Box 830, Sofia 1000, Bulgaria.

Black Sea Award — *This award is valid for QSO/SWL reports after 1st January 1979, with 60 different amateur stations located in the countries bordering the Black Sea. A minimum of one QSO/SWL report with each of the following countries is an additional condition — LZ; TA; YO; UA6 and UB5.*

Sofia Award — *Valid OSO/SWL points after 1st January 1979 — 100 points for reports with amateur stations situated in the Bulgarian capital, Sofia. The calculation of the points has to be made from the following table.*

Each single contact is worth 15 points on 3.5MHz; 5 for 7MHz; 1 for 14MHz; 2 for 21MHz and 3 for 28MHz. NOTE: One contact per band irrespective of mode.

Some of the more active stations in Sofia are: *LZ1s — KAA; KAB; KDP; KPG; KSA; KSF; KVV; KWF; AB; AD; AM; AP; AO; AU; BC; FF; FN; IA; JW; KX; LB; MS; NP; OG; QI; QP; SS; UA; UO; WV; WD; WJ; XL; XX AND ZQ.*

People's Republic of Bulgaria — *20 QSOs with different Bulgarian amateur radio stations; 10 with LZ1 and 10 with LZ2 irrespective of band.*

5 Bands LZ Award — *10 QSOs, one with LZ1 and one with LZ2 on all bands; 3.5, 7, 14, 21 and 28MHz.*

W 100 LZ Award — *100 QSOs with different LZ SWL stations during one calendar year.*

W 28 Z ITU Award — *This award requires QSOs/SWL reports with the following countries of ITU Zone 28: DL; DL7/W. Berlin; FC/TK; HA; HB9; HB0; HV; I; IS; LZ; 9A/M1; OE; OK; SP; SV; SV5; SV9; SY; YO; YU; Y2; ZA; 9H; 4U1ITU.*

The award is issued in three classes:

Class 1 — 28 QSOs with different stations in 20 countries

Class 2 — 28 QSOs with different stations in 16 countries

Class 3 — 28 QSOs with different stations in 10 countries

An additional five QSOs with different LZ stations are also required.

** The above awards may be claimed when sending logs for the LZ DX Contest — see Contest Column for rules of this contest.*

AR

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685MHz — Summer: 7.064MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGEMENTS

This month we are indebted to AMSAT-DL for the draft specification of the RUDAK Experiment to be flown on the Phase-3C spacecraft. As mentioned in last months column, I have edited this specification to make it presentable for this column. Those persons wishing to peruse the complete document can obtain one by contacting Graham VK5AGR, QTHR. At the time of preparing these notes, I noted a block of OSCAR 10 indicating that the RUDAK flight unit had been completed and the initial contacts made through it. It does indeed appear to be an interesting experiment to follow when Phase-3C is launched later this year. It is currently scheduled for September.

RUDAK SPECIFICATION DRAFT — 15th May 1985

General — This document has been compiled for, and on behalf of AMSAT-DL eV by Hanspeter Kuhlen DK1YQ.

Comments are invited and shall be addressed to the author: *H Kuhlen DK1YQ, Finkenstr 11, D-8011 Aschheim /nr Munich, FR Germany,*

Introduction — This document specifies the digital experiment scheduled to be launched onboard AMSAT OSCAR Phase-3C satellite with Ariane IV. Its main purpose is to provide a comprehensive documentation on the technical requirements and desirable features to achieve a common understanding among the equipment designers and manufacturers, as well as the satellite system group.

SATELLITE ACTIVITY FOR PERIOD 1 to 28 DECEMBER 1985.

1. LAUNCHES.

The following launching announcements have been received:-

1985-111A	Cosmos 1705	Dec 03	USSR
112A	Cosmos 1706	Dec 11	USSR
113A	Cosmos 1707	Dec 12	USSR
114A	USA 13	Dec 13	USA
114B	USA 14	Dec 13	USA
115A	Cosmos 1708	Dec 13	USSR
116A	Cosmos 1709	Dec 19	USSR
117A	Molniya 3-27	Dec 24	USSR
118A	Cosmos 1710	Dec 24	USSR
118B	Cosmos 1711	Dec 24	USSR
118C	Cosmos 1712	Dec 24	USSR
119A	Meteor 2-13	Dec 26	USSR
120A	Cosmos 1713	Dec 27	USSR
121A	Cosmos 1714	Dec 28	USSR

2. RETURNS.

During the period forty three objects decayed including the following satellites:-

1985-101A	Cosmos 1699	Dec 23
1985-109A	STS-61B	Dec 03
1985-111A	Cosmos 1705	Dec 17
1985-115A	Cosmos 1708	Dec 27

3. GENERAL.

As at 0142 UT on 14 Dec 1985 satellite ATS 1 was located at 82.61°W. Inclination 11.931°.

The experiment has been named *RUDAK* for Regenerativer Transponder fur Digitale Amateurfunk Kommunikation.

The mission shall serve two purposes —

1 Point-to-point connections utilising the AX.25 link protocol

2 In as much as possible inter-connect Local Area Networks (LAN) to accomplish a low rate, time shifted data/message exchange. ie link between mail boxes.

The RUDAK Experiment shall support digital communication and trials with link control protocols and other processor based technique.

Highest possible flexibility with regard to future higher level protocols will be achieved by fully reloadable RAM-resident software.

System Description — The growing interest in digital communication in amateur radio necessitates a satellite channel for investigations on typical channel characteristics, as well as gaining experience in digital operating modes.

System Architecture and Network Configuration — A *network* is understood as consisting of a number of individual subscriber stations of equal priority in a widely spread area. Each station is equipped with RF facilities and a dedicated processor called terminal node controller, or equivalent S/W and a display and/or a general purpose computer. The latter is not required for QSO-type of communication.

At present, several local area networks (LAN) with a limited number of participants are in the process of realisation world-wide.

Most of these networks are supported by digipeaters acting as link controllers connecting amateurs with critical RF-links.

Except for the digipeater function, the applied protocol AX.25, Version 2.0/10.84 enables link establishment in accordance with level 2 of the ISO-OSI Reference Model providing sufficient commonality among the participants during the absence of an appropriate level 3 and 4 Transport Protocol.

Inter-connection of individual stations is the typical future however, the unique technical features of the packetised transmission become obvious only in a meshed network.

One important characteristic of a network is its ability of quick response to a service request, ie to send a QSO-packet from A to B (throughput).

On one hand, this response time is dominated by the applied bit-rate. For terrestrical networks, this parameter has been selected as 1200 bit/s to cope with bandwidth characteristics of standard amateur equipment by utilising straight-forward FSK for channel coding.

On the other hand, the conflict of sending packets into the net without precise co-ordination results in loss of packets due to collision.

For a subscriber having access to a common repeater in a relatively small area, most of these collisions can be avoided by a technique called Carrier Sensed Multiple Access (CSMA).

As soon as the receive logic of a TNC detects a data carrier on the channel, it holds back transmissions until the channel is free again.

The still-existing problem of congestion of pending packets is solved by generating random delay times for re-transmission. All this works fine in small areas where propagation delay times are negligible.

The next step is providing digipeaters on elevated geographical positions, hence visibility over a fairly great distance. Here the competition of non-organised packet transmissions reduces the throughput significantly to 18 percent, even under, otherwise optimum conditions. (ALOHA)

In other words, due to unavoidable collisions we achieve an effective data-rate of 0.18 * 1200 bit/s = 216 bit/s or less than one fifth of the applied rate.

Without additional agreement or co-ordination (slotted ALOHA), no improvement is possible.

In this environment, the RUDAK-Experiment shall add a long distance link between experimenters and LANs.

The main task of the regenerative on-board facility shall to be to decode and digipeat (encode) the received packets adding no particular intelligence at the first stage of the experiment. The throughput is limited by the capacity of the downlink bit-rate: 400 bit/s.

OSCAR-10 APOGEES
APRIL 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st April										
91	2109	1942:08	-26	119	112	5				
2nd April										
92	2110	0721:38	-26	294	250	9	256	20	264	40
92	2111	1901:08	-26	109	117	-2				
3rd April										
93	2112	0640:38	-26	285	254	17	261	28	269	49
4th April										
94	2114	0601:05	-26	275	259	25	265	36	274	58
5th April										
95	2116	0520:05	-26	266	263	33	270	45	282	67
6th April										
96	2118	0439:05	-26	256	268	42	276	54	296	76
7th April										
97	2120	0358:05	-26	247	273	51	284	62	336	82
8th April										
98	2122	0317:05	-26	238	280	59	297	71	45	80
9th April										
99	2124	0236:05	-26	228	290	68	324	78	71	72
10th April										
100	2126	0155:05	-26	219	310	76	15	79	81	63
11th April										
101	2128	0114:05	-26	209	356	81	53	74	88	54
12th April										
102	2130	0033:05	-26	200	46	77	70	66	93	45
102	2132	2352:05	-26	191	68	69	80	57	97	36
13th April										
103	2134	2311:05	-26	181	79	61	87	49	101	28
14th April										
104	2136	2230:05	-26	172	86	52	92	40	105	19
15th April										
105	2138	2149:05	-26	162	91	43	97	32	109	11
16th April										
106	2139	0928:35	-26	338					246	2
106	2140	2108:05	-26	153	96	34	101	23	113	4
17th April										
107	2141	0847:35	-26	328					250	9
107	2142	2027:05	-26	144	100	26	106	15		
18th April										
108	2143	0808:01	-26	319			244	-0	254	17
108	2144	1947:31	-26	134	105	18	110	8		
19th April										
109	2145	0727:01	-26	310	243	-3	249	7	258	25
109	2146	1906:31	-26	125	109	10	115	1		
20th April										
110	2147	0646:01	-26	300	247	4	254	15	262	34
110	2148	1825:32	-26	116	113	3				
21st April										
111	2149	0605:02	-26	291	252	12	258	22	266	42
22nd April										
112	2151	0524:02	-26	281	256	19	263	31	271	51
23rd April										
113	2153	0443:02	-26	272	261	28	268	39	277	61
24th April										
114	2155	0402:02	-26	263	265	36	273	48	287	70
25th April										
115	2157	0321:02	-26	253	270	45	280	56	307	78
26th April										
116	2159	0240:02	-26	244	276	53	289	65	3	82
27th April										
117	2161	0159:02	-26	234	284	62	306	73	55	77
28th April										
118	2163	0118:02	-25	225	297	71	340	79	74	69
29th April										
119	2165	0037:02	-25	216	323	78	30	78	83	60
119	2167	2357:28	-25	206	15	80	58	71	89	51

The afore-mentioned collision problem exists for the high elevated geographical position of the satellite in the elliptical orbit in particular.

Therefore, the uplink bit-rate has been selected to be 2400 bit/s to cope with this problem. Consequently, the RUDAK-Experiment will provide a throughput greater than achievable with elevated digipeaters using 1200 bit/s, but lower than well co-ordinated local area networks. (CSMA controlled).

It is well known that bit-rates of that order of magnitude are far from quantities of commercial relevance, thus it makes no substantial difference if 400 or 1200 bit/s are selected. Hence, the RUDAK-Experiment shall serve as a digital channel between individual stations world wide and in as much as possible, connect networks. The latter may work better in practice than can be expected theoretically.

All of these assumptions are considered valid for a first phase of packet radio in low speed mode.

A major improvement can only be expected by significant increase in data-rates, eg 64 or even 128 kbit/s.

System Objectives — The main purpose of the RUDAK-Experiment is to provide a digital link for two-way amateur packet radio communication

OSCAR-10 APOGEES
MAY 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
29th April										
119	2167	2357:28	-25	206	15	80	58	71	89	51
30th April										
120	2169	2316:28	-25	197	54	74	73	63	93	42
1st May										
121	2171	2235:28	-25	188	71	66	81	54	98	33
2nd May										
122	2173	2154:28	-25	178	80	57	88	46	102	25
3rd May										
123	2175	2113:28	-25	169	87	49	93	37	105	16
4th May										
124	2177	2032:28	-25	159	92	40	98	29	109	8
5th May										
125	2178	0811:59	-25	335					248	4
125	2179	1951:29	-25	150	97	31	102	20	114	1
6th May										
126	2180	0730:59	-25	325					252	12
126	2181	1910:29	-25	141	101	23	107	13		
7th May										
127	2182	0649:59	-25	316			247	2	256	20
127	2183	1829:29	-25	131	105	15	111	5		
8th May										
128	2184	0609:02	-25	306	245	-1	251	9	260	28
128	2185	1748:32	-25	122	110	7	116	-2		
9th May										
129	2186	0528:02	-25	297	250	6	256	17	264	36
129	2187	1707:32	-25	112	114	-0				
10th May										
130	2188	0447:02	-25	288	254	14	260	25	269	45
11th May										
131	2190	0406:02	-25	278	258	22	265	33	274	54
12th May										
132	2192	0326:30	-25	269	263	30	270	41	282	63
13th May										
133	2194	0245:30	-25	260	268	38	276	50	294	72
14th May										
134	2196	0204:30	-25	250	273	47	284	59	322	80

over great distances. One of its most peculiar characteristics is the fact that the channel is not *transparent* as it is the case with the more familiar linear transponder, but it is *regenerative*.

Regenerative means full demodulation and decoding of the uplink signal and re-generating a new (composed) downlink signal with no change in packet content, but with added features. Full participation in this service shall be possible with reasonable ground station complexity, ie standard amateur RF equipment in conjunction with a terminal node controller and alpha-numeric display as a minimum.

The digital channel encoding and decoding will be achieved by means of a phase modulated subcarrier in the audio band. An external modem will provide the facility for generation of the subcarrier and its phase modulation as a function of the packet data stream.

In order to avoid a noticeable DC component in the transmission signal and to achieve a fast synchronism between sender and receiver under all data conditions, the data stream will be additionally encoded in Bi-Phase-L, also known as Split-Phase-L. (Spectrum shaping).

The ambiguity of the received and decoded BPSK-signal may lead to a 100 percent error condition due to inversion of the restored reference phase.

Hence, not the absolute phase condition provides the **0** or **1** information, but the difference of the phase of two consecutive bit periods.

Independent from the AGC of the main pass band the RUDAK-Experiment will get its own channel for operation within the constraints of the L-band transponder.

The link budget calculations as summarised in chapter 7.2 have been based on a link quality of Eb/No = 12db, which should provide an effective BER of 10^{5}. This in turn implies a packet error rate of 10^{-2} for a 1200 bit packet.

There will be a continuous operation of the downlink beacon whenever the L-mode is activated. This under all detrimental circumstances leaves sufficient time to synchronise to carrier and bit-clock, even for the less skilled user.

In order to avoid long periods of idle pattern, which would be required to maintain synchronisation a sequence of cyclic repeating information packets will be inserted into the data stream.

These packets will contain identification details of the satellite, telemetry blocks in open language with extracts from the normal housekeeping TM with continuous updates, keppler and other orbit information, etc.

RUDAK Experiment — The hardware of the RUDAK-Experiment will be housed in a single standard metal box. Three interfaces interconnect RUDAK with the rest of the payload: *DC Power Supply; L-Transponder; Integrated Housekeeping Unit.*

It receives digital information from the dedicated BPSK demodulator as *data* and coherent *clock* signal. After processing the downlink signal is generated as data EXORed with the clock and routed to the phase modulator of the 436.020MHz transmitter.

Packet radio in its present form only provides error free communication by application of error detection and, if necessary, automatic request for re-transmission with an appropriate ARQ packet.

The RUDAK-Experiment shall support potential forward error correction (FEC) of at least singular errors.

Any possible link improvement by means of soft decision decoding versus hardware complexity will be investigated and if feasible be considered as a valid and desirable option. The entire packet processing (assembly/disassembly) shall be in compliance with the AX.25 link level protocol specification as released Version 2.0/10.84.

An appropriates packet management software shall organise incoming and outgoing packets, decide on priorities between user packets and onboard generated information.

Variable packet length with a maximum 128 bytes (optionally 256 bytes) shall be processed.

The packet management shall organise a queueing routine for all down-going packets with high priority for upcoming and less priority for onboard generated packets within remaining memory space as buffer area.

A closed loop self-test routine shall enable trouble-shooting on request of privileged command stations.

RUDAK shall otherwise operate without scheduled maintenance or similar permanent supervision. It shall not get blocked by erroneous interpretation of any data content.

Definition of User Equipment — Equipment required for *RECEIVE ONLY* 436.020MHz USB receiver, BPSK-Demodulator: 400 bit/s and TNC with AX.25 or equivalent. *FULL PACKET STATION* same as receive only plus a 1296.675MHz transmitter and BPSK-Modulator: 2400 bit/s.

AMSAT-AUSTRALIA NEWSLETTER

Graham VK5AGR, the National Co-ordinator of AMSAT-Australia is now producing a monthly newsletter containing updated satellite news, orbital predictions, keplerian data and operating hints and techniques. The objective of the newsletter is to keep the amateur populous informed on the latest information available and to realise funds for the funding of projects, or the purchase of an item/s of hardware for a future amateur satellite project, eg Phase-3C, Phase-4, etc. The cost of the newsletter is $15 and cheques made payable to the WIA (SA Division) should be forwarded to Graham VK5AGR, QTHR.

To date the newsletter has been a resounding success within Australia and comments from overseas amateurs, who have received copies from friends within Australia indicate that they would also like something similar in their own countries. The newsletter is basically an eight page compendium of the nitty-gritties that are relevant in the short-term, items that are out-of-date when printed in this column, etc. To date it has included some small computer programs specifically for satellite determination, the latest telemetry blocks from OSCAR-10 and OSCARs-9 and 11. If you are at all interested in Satellite communication, this newsletter is a must for you.

AR

Education Notes

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NAOCP THEORY

Following is a trial examination paper for Novice Theory. Answers appear at the end of the column.

1 A solenoid could be used:

a as part of a keying relay.
b to vary the frequency of a tuned circuit.
c as an impedance matching device.
d as a voltage stabiliser.

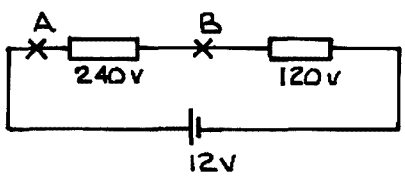
2 In an SSB transmitter the output frequency is obtained by:

a selecting any even harmonic.
b using multiplier stages.
c filtering.
d heterodyning.

3 The velocity of a wave in a transmission line is:

a 300 000 000 metres per second.
b 6 800 000 metres per second.
c less than its velocity in free space.
d more than its velocity in free space.

4 The potential difference between A and B is:



a 12 volts.
b 8 volts.
c 6 volts.
d 4 volts.

5 In a thermionic vacuum tube the high voltage is applied to the:

a cathode.
b heater.
c control grid.
d anode.

6 'P' type semi-conductor material has:

a surplus electrons.
b surplus 'holes'.
c a residual positive charge.
d a residual negative charge.

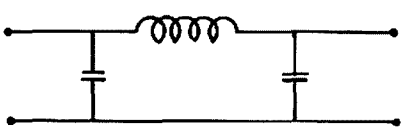
7 The modulation percentage of an AM transmission can be calculated from:

a carrier voltage and total power output.
b modulation voltage and carrier frequency.
c the pattern displayed on a cathode ray oscilloscope.
d carrier amplitude and modulation frequency.

8 Direct keying of an oscillator stage is likely to produce:

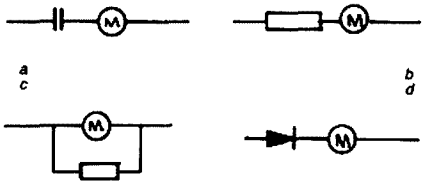
a key clicks.
b splatter.
c chirps.
d harmonics.

9 This filter is known as a:



a low pass.
b high pass.
c band rejection.
d band pass.

10 To increase the DC voltage range of a meter its circuit should be modified as shown:



a
c
b
d

11 The solid state equivalent of a gaseous regulator tube is a:

a bridge rectifier.
b FET.
c varicap diode.
d zener diode.

12 The detector in an 'AM only' receiver could be a

a diode.
b beat frequency oscillator.
c product detector.
d heterodyne detector.

13 The bandwidth of a correctly modulated AM signal is:

a half the modulating frequency.
b carrier frequency + modulating frequency.
c twice the modulating frequency.
d three kilohertz.

14 Interference caused by an amateur transmission is heard on a small portable broadcast receiver but not on a more elaborate receiver. The interference is probably:

a not noticeable in the higher sound output from the larger receiver.
b due to front end overload.
c due to parasitic oscillations in the final stage of the transmitter.
d reduced by using an external antenna on the small receiver.

15 The feedline on a Yagi antenna is connected at the:

a reflector.
b director.
c driven element.
d boom.

16 Which of the following is not an electrical insulator?:

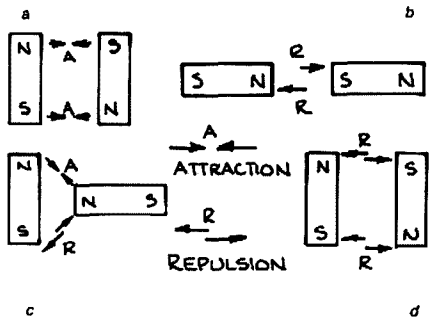
a mica.
b ceramic.
c sea water.
d oil.

17 The impedance of a transmission line:

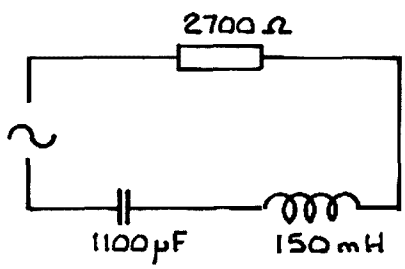
a is a maximum at each quarter wavelength point.
b varies according to whether or not it is terminated in a load.
c depends on the diameter and spacing of the conductors.
d is purely resistive.

18 If two bar magnets are placed close together, the forces will be as shown in:

A Attraction R Repulsion



19 The total impedance of the circuit will depend on the:

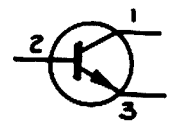


a input voltage.
b current flow.
c capacitor dielectric.
d applied frequency.

20 When a triode amplifier is operating in class A mode current flows:

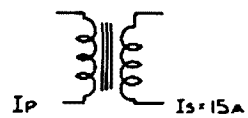
a all the time.
b for half of each cycle.
c for less than half of each cycle.
d whenever the grid voltage is beyond cut-off.

21 This diagram shows a:



a NPN transistor, terminal 2 is the gate.
b NPN transistor, terminal 1 is the collector.
c PNP transistor, terminal 3 is the base.
d PNP transistor, terminal 2 is the emitter.

22 If Np/Ns = 10/1, Ip will be:



a 0.15 amps.
b 1.5 amps.
c 15 amps.
d 150 amps.

23 The output of the mixer stage in a receiver will contain:

a both input frequencies and their sum.
b both input frequencies, their sum and their difference frequencies.
c the higher frequency and the sum of both input frequencies.
d the sum and difference of the two input frequencies.

24 The length of the sunspot cycle is about:

a 27 days.
b 4-5 weeks.
c 11 years.
d 27 years.

25 In a quarter wavelength vertical antenna the:

a feed point impedance is 73 ohms.
b voltage minimum is at the feed point.
c current maximum is at the tip.
d radiation pattern is substantially omni-directional.

26 For a given inductor, the reactance increases as:

a the applied frequency is decreased.
b turns are removed.
c the applied voltage is increased.
d the applied frequency is increased.

27 An appropriate power supply transformer for a Novice SSB transmitter should be rated at about:

a 10 watts.
b 30 watts.
c 50 watts.
d 400 watts.

28 The AGC line of a receiver functions by:

a varying the bias to the audio amplifier stage.
b varying the bias to an IF amplifier stage.
c limiting the swing of the S meter needle.
d limiting the RF amplifier stage output.

29 Differences of HF propagation patterns between night and day may be due to changes in the:

a density of the troposphere.
b sunspot numbers.
c velocity of the radio wave.
d degree of ionisation of ionosphere layers.

30 A keying relay may be used to:

a smooth the rise and fall of the symbol.
b pass traffic between two stations which cannot make direct contact.
c shorten the gaps between the symbols.
d avoid having high voltage on the key terminals.

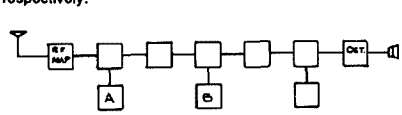
31 'Splatter' occurs in SSB transmission when:

a over-modulation causes the transmitter amplifier stages to become non-linear.
b two concurrent transmissions are separated by less than 3kHz.
c the oscillator power supply is not frequency stable.
d uneven harmonics are present in the transmitter output.

32 The sensitivity of a voltmeter is usually described in:

a ohms per volt.
b volts per amp.
c ohms per milliamp.
d watts per volt.

33 In this super-heterodyne receiver, blocks A and B represent respectively:



a local oscillator and beat frequency oscillator.
b two local oscillators on different frequencies.
c two local oscillators on the same frequency.
d carrier insertion oscillator and beat frequency oscillator.

34 The distance achieved by ground wave propagation:

a is greater at higher frequencies than at lower frequencies.
b can be extended by increasing the angle of radiation.
c is affected by the surface medium.
d can be increased by using frequencies above the MUF.

35 Harmonics from a novice operator on 28.100MHz causes interference to a nearby television receiver. The channel most likely to be affected will be:

a Channel 0 (45-52MHz)
b Channel 2 (63-70MHz)
c Channel 6 (174-181MHz)
d Channel 9 (195-202MHz)

36 The DC power input to the final amplifier of a transmitter may be determined by measuring:

a anode current and output impedance.
b collector or anode current and voltage.
c collector current and beta of the final transistor.
d output voltage of the power supply and total current drawn.

37 The ionospheric layer responsible for most hf refraction at night is the:

a F layer.
b F1 layer.
c E layer.
d D layer.

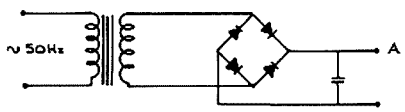
38 A balanced modulator is used to:

a suppress the carrier in an SSB transmitter.
b even out the modulation level of a receiver
c match the modulating frequency to the RF.
d feed two modulating signals to a buffer stage.

39 A single conversion super-heterodyne receiver tuned to 3.620MHz, has a local oscillator operating on 4.075kHz. The image frequency will be:

a 455kHz.
b 910kHz.
c 3.165kHz.
d 4.530kHz.

40 The output at A will be:



a steady DC.
b DC with 50Hz ripple.
c DC with 100Hz ripple.
d 50Hz AC.

41 A 1.5V dry cell has a 2 amperehour capacity. Four of these cells connected in parallel would provide:

a 6V for 2 amphours.
b 6V for 0.5 amphours.
c 1.5V for 8 amphours.
d 1.5V for 2 amphours.

42 The PIV rating of a diode is 45 volts. This means that:

a a reverse bias of 45 volts must not be exceeded.
b 45 volts is the normal working voltage.
c the diode can withstand 45 volts AC.
d two of these diodes in parallel would have a PIV of 90 volts.

43 A varactor (varicap) diode:

a must never be reverse biased.
b can be used to vary the frequency of a tuned circuit.
c can be used in place of a light emitting diode.
d uses the capacitive effect to vary the circuit current.

44 A novice Am transmitter capable of operating on all HF novice bands has a crystal on 3.600MHz. The transmitter is likely to incorporate:

a at least two other crystal oscillators.
b a 455kHz IF.
c a heterodyning mixer and two other crystal oscillators.
d a switching system and multiplier stages.

45 Neutralisation of an amplifier stage is carried out:

a by applying negative feedback.
b to prevent parasitic oscillations.
c to reduce harmonic output.
d only if it is a linear stage.

46 As well as matching impedances between transmitter and transmission line, an antenna tuning unit:

a allows the antenna length to be adjusted for frequency changes.
b reduces the radiation of harmonics.
c improves the front to back ratio of a Yagi antenna.
d provides a good earthing system.

47 A transistor operating in a common emitter circuit:

a has a low current gain.
b has the base-emitter junction reverse biased.
c has a high 'beta'.
d must be an NPN type.

48 A 21MHz novice SSB transmitter, while unmodulated, causes interference to several nearby television receivers. The symptoms suggest the problem is due to:

a excessive drive to the transmitter's final stage.
b excessive transmitter output.
c receiver cross-modulation.
d parasitic oscillation in the transmitter.

49 The fuse in a mains operated power supply should:

a be rated at about three times the expected current.
b be in the earth lead.
c have a high impedance.
d be in the active lead.

50 The value of a resistor colour coded yellow, violet, red and silver is about:

a 4.7 kohms.
b 47 kohms.
c 4.7 ohms.
d 470 ohms.

ANSWERS TO NOVICE TRIAL EXAMINATION

1a	11d	21b	31a	41c
2d	12a	22b	32a	42a
3c	13c	23b	33b	43b
4b	14b	24c	34c	44d
5d	15c	25d	35d	45a
6b	16c	26d	36b	46b
7c	17a	27c	37a	47c
8c	18c	28b	38a	48d
9a	19d	29d	39d	49d
10b	20a	30d	40c	50a

CW FOREVER

You must have at times, thought into the past,
Where some things go out, while others last,
What comes to my mind is the old Morse Code,
That has weathered the storms from any abode.
To talk with one's fingers is surely an art,
Of any info you care to impart.
In most conditions the signals get through,
While the same about phone is simply not true.
Those dits and dahs cut through the trash,
Of nearby noise or lightning's crash,
To the sensitive ears of the ham receiver,
Who records this data with ardent fever.

He knows he's doing something unique,
(In such poor conditions, that's quite a feat).
To Roger the message that came off the air,
These Brass Pounders sure do have that flair.
They say Morse ops are a dying breed,
But don't despair, there's always that need,
That when conditions get rough for the new automation,
Rest assured, there'll be need for your station.
CW is dying? Believe it never,
This mode will be around forever and ever,
But one thing is sure, what we really need,
Is to relay our knowledge to the younger breed.
To carry the torch, long after we're gone,
To send Morse code through the air like a song,
When at last, Silent Keys pull that final lever,
We can rest in peace, it's CW forever.

From WORLDRADIO, January 1986

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Now is the time of the year when the final figures are available for the previous years Intruder Watch activities. I state them below for your information.

Total Number of Intrusions Reported	*7466*
Those in the Broadcast Mode	*4289*
Those in the CW Mode	*1208*
Those in the RTTY Mode	*1516*
Intruders who Identified	*843*
Number of Observers Supplying Reports	*51*
Number of Log Sheets Received	*543*

The breakdown of assisting Observers is as follows:

OBSERVERS	DIVISION	LOGS RECEIVED
1	**VK1**	*5*
12	**VK2**	*98*
9	**VK3**	*33*
15	**VK4**	*330*
6	**VK5**	*43*
3	**VK6**	*7*
3	**VK7**	*20*
2	**VK8**	*7*

WINNER ON THREE

The Intruder Watch scored three against the intruders in 1986 — a French Polynesian R/T service on the lower end of 40 metres was removed; an Australian broadcast station's fourth harmonic, which was being heard on the 80 metre band was dealt with, and the US FCC opened a case against a maritime mobile station which was passing commercial traffic on 20 metres, assisted by two US amateurs. (This traffic has now ceased).

So, at least three less sources of QRM are on the bands this year, due to the efforts of those who send in reports to the Intruder Watch.

QSL CARDS

Just in passing, those QSL cards that I sent to the ARRL, which I mentioned in last month's column, have not arrived back yet, so fingers are still crossed!

Those of you with RTTY facilities may care to fire-up on 14.024MHz, and see if you can find out who is there . . . It has been heard at 0646 and 0900-1200UTC.

CW AND SSB MIXED!

I recently had a complaint about SSB stations working on the CW segment of 15 metres. This is **not** Intruder Watch business, but it is unfortunate to see that people cannot observe the Gentleman's Agreement and WIA Band Plans, and avoid conflict with others in the hobby.

The intruder Y5K, an old friend *(?)*, who works RTTY on 20 metres, has finally been caught at the receiving end, which was T7S on 13.342MHz.

The *Voice of Greece*, beaming to Australia on 7.095MHz, has now apparently moved to 7.420MHz, well out of our way, and one wonders why they did not operate there in the first place ? ? ?

NUPTIAL BLESSINGS

I don't know if I am letting *the cat out of the bag* on the next piece of news, but Robin VK7RH, the Tasmanian Intruder Watch Co-Ordinator, writes to tell me that he *"will be very busy this year, as he is moving QTH due to the fact the he is GETTING MARRIED!"*

Well, Robin didn't tell me not to say anything, so there it is. All the very best to you, and the future Mrs Harwood, Robin. I am sure I speak for all involved in the Intruder Watch.

Better go before I get chased away from the keyboard. See you all next month, and good DX.

AR

ARRL 75TH ANNIVERSARY

The ARRL Board have taken two actions regarding forward planning for the ARRL's 75th Anniversary in 1989. ARRL will offer to host the 1989 Triennial IARU Region 2 *Conference*. The criteria for selecting the 1989 ARRL National Convention was adopted. Final selections will be made at the Board's July 1986 meeting.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

The first quarter of 1986 is behind us — *Where did it go?*

It is pleasing to see ALARA continuing to grow and flourish, with increasing YL participation in every facet of amateur radio activity. We have come a long way from the days when a YL voice on the air-waves was a rare thing to hear.

This month I would especially like to congratulate ALARA's *Newsletter* editor, Marlene VK5QO, who was the recipient of the Alan Shawsmith Journalistic Award, 1985, for her article on the history of the VK5 Division of the WIA, October 1985 AR.

Congratulations also to Mavis VK3KS, who gained third placing in the CW section of the 1985 DX-YL to North American YL Contest. The prowess of Mavis and her OM Ivor, with the key is well-known, and as early as the beginning of February, they had both attained the necessary points on CW for the South Australian Jubilee 150 Award.

ALARA AWARD

The ALARA Award, with its lovely Australian wildflower theme, continues to be popular. See rules in December 1985 AR.

It has been suggested that from time to time we print an update of Award recipients, so accordingly here is the list from September 1985, to January 1986.

All endorsements are A3J and those marked * have one sticker.

NO	DATE 1985	NAME & CALL
109	5 Oct	David Beecham VK2CDB
110	5 Oct	David Jewell VK0DJ
111	21 Nov	Ivan Searle VKSNSI*
112	21 Nov	Des Hancox VK2AGA
113	27 Nov	Ross Wilson VK2BRG
114	9 Dec	Vic Hearne VK3CQP*
102	24 Dec	Keith Turk VK2PKT*
104	24 Dec	Dennis Middleton VK2NAN*

YL ACTIVITIES LIST

A list of YL nets and activities has been compiled by Ash Nallawalla ZL4LM/VK3CIT. Ash is the OM of Lesley VK3PZA. To my knowledge this is the first time anyone has attempted such a list, and we would like to thank Ash for his most detailed and comprehensive effort.

Obviously there are bound to be additions and alterations to any such list, and Ash would appreciate information of any changes since the list was formulated.

MHz	UTC	DAY	DETAILS	REMARKS
3.535	****	*Mon*	ZL WARO CW net ZL2AGS 4th Mon	2000 local
3.560	1830	*Fri*	BYLARA CW net	
3.580	1030	*Mon*	ALARA nat	1000UTC Summer
	1030	*Fri*	YL net	
3.568	****	***	YL activity on the hour	6th of month
	0730	*Fri*	ZL YL Gathering Frequency	ZL1MY
3.670	1530	*Tue*	MINOW net	+ 1 hour in Winter
3.690	1815	*Mon*	BYLARA SSB net	
3.700	0800	*Mon*	ZL WARO National net	
	2000	*We-*	OL-YL net	0630?
	0700	*Sat*	Euro YL net	Weekdays only?
	0700	*We-*	Euro-YL net	Sat only?
3.710	1500	*Dly*	Dutch YL net	
3.770	2000	*Sat*	Ontario Trilliums net (VE)	+1 hour Winter
3.775	0300	*Thu*	Dogwood net (VE)	
	0300	*Mon*	Wild Rose net (VE)	
	0130	*Tue*	CLARA net (VE)	4th Tue
3.910	1230	*We-*	Yankee Lassies net	
	1400	*Sat*	Hawk Roost net	
3.913	1500	*Fri*	MINOW net	+ 1 hour in Winter
3.922	1400	*Mon*	UPYL net	
3.926	0100	*Thu*	YLISSB System net	
3.933	1400	*Tue*	Floridorsa net	
	0400	*Fri*	Working Girls net	
3.940	1400	*Thu*	TYLRUN net	
3.943	0200	*Dly*	County Hunters' net	
3.945	1400	*Fri*	SAYLARC net	
3.950	1300	*Thu*	TASYL net	+1 hour in Winter
	1400	*Mon*	Buckeye Belles net	
3.955	1700	*We-*	Gaylark net	
3.973	0100	*Tue*	Buckeye Belles net	
3.980	1400	*Mon*	W1SYL net	
3.990	1430	*Sun*	Western Pennies net	1st Sunday
7.038	0300	*We-*	YL CW net	
7.060	1200	*Mon*	South Africa YL net	
	0545	*Tue*	YL net	
7.088	****	***	YL Activity on the hour	6th of month
7.130	0230	*We-*	LARK net	
7.235	1700	*Tue*	Ironing Board net	
7.240	1400	*Sat*	SAYLARC net	+1 hour in Winter
7.260	1300	*Mon*	Shirts and Skirts nat	+1 hour in Winter
	1300	*Fri*	TASYL net	1st Friday
7.261	1700	*Dly*	SPARCYL net	
7.270	1400	*Fri*	Midwest YL net	
7.275	0030	*Tue*	YL ISSB System net	
	0030	*We-*	YL ISSB System net	
	0030	*Fri*	YL ISSB System net	
	0030	*Sun*	YL ISSB System net	
7.288	1500	*Tue*	Coffee Cup net	
14.050	****	***	YL CW Activity on the hour	15th of month
	0300	*Mon*	YL CW net	
	0300	*Fri*	YL CW net	
	0300	*We-*	YL CW net	
14.120	0200	*Tue*	CLARA After Dark net	1, 3, 5th Tue
	0030	*Sun*	CLARA Sundey net	
14.160	0800	*Mon*	VK Natter net	
	1900	*Tue*	CLARA 20m net	
	0500	*Thu*	YL Group net	
	0800	*Thu*	VK Natter net	
	0500	*Fri*	VE/VK/ZL YL CW net	
14.188	1400	*Mon*	Indian YL net	
14.200	0630	*Mon*	DX-YL net	
14.220	0630	*Mon*	YL-only net	OMs 1st Monday
14.250	1900	*We-*	PY-BRYLA net	
14.280	****	***	YL Activity on the hour	6th of month
14.288	****	***	YL Activity on the hour	6th of month
	1900	*We-*	YL Open House net	YLRL
14.295	1800	*Tue*	QCWW net	
	1800	*Thu*	Tangle net	YLRL
14.332	0900	*Tue*	Open House YL DX net VK6YL	1000UTC Summer
	0900	*Thu*	Open House YL DX net VK6YL	1000UTC Summer
14.333	1600	*Dly*	YL-ISSB net	
	0920	*Tue*	YL ISSB System net	
	0300	*Sat*	YL ISSB net (VK/ZL portion)	
14.336	1600	*Dly*	YL County Hunters net	
21.050	****	***	YL CW Activity on the hour	15th of month
21.183	0400	*Fri*	VE/VK YL net VK6NYL	
21.188	****	***	YL Activity on the hour	6th of month
	0400	*Fri*	YL net	
21.355	1430	*Dly*	YL OX net	
21.373	1500	*Thu*	YL ISSB System net	
21.375	1500	*Tue*	YL 21 net	
21.380	****	***	YL Activity on the hour	6th of month
21.388	****	***	YL Activity on the hour	6th of month
	1500	*We-*	US-German YL Activity	
28.050	****	***	YL CW Activity on the hour	15th of month
28.133	2300	*Fri*	YL CW Activity	4th Friday only
28.450	2300	***	YL CW Activity on the hour	15th of month
	2300	*Fri*	YL CW Activity	4th Friday only
	2300	*Fri*	VE/VK/ZL YL phone net	
28.470	0430	*We-*	Midweek YL net VK2KDX	
28.488	1900	*Sun*	CLARA 10m net	
28.588	****	***	YL Activity on the hour	6th of month
28.650	1345	*Mon*	PJYL net	
28.673	1500	*Sun*	YL ISSB System net	+1 hour in Winter
28.688	****	***	YL Activity on the hour	6th of month
	1400	*Sun*	BYLARA DX net	
28.805	1400	*We-*	US-German YL Activity	

YL CONTESTS

YLRL DX-YL to North American YL Contest — the CW section is held from 1800UTC on 9th April to 1800UTC on 10th April. Phone section is held from 1800UTC on 16th April to 1800UTC on 17th April. Logs should be sent to Mary NM7N.

NZ WARO Thelma Souper Memorial Contest 1986 — held from 0700-1000UTC each evening on 5-6th April. Logs to be sent to Vicki ZL1OC.

NEW MEMBERS

Welcome to new members —
Lee ZS1YL, who joined on 27th January 1986 and was sponsored by Bev VK6DE.
Marion WA7TLL, who joined on 29th January 1986, and sponsored by Josie VK4VAN.
Mary KE5UO, who joined on 10th February 1986, sponsored by Jill VK4ASK.

CALL SIGN CHANGES

Paula DJ0EK is now PA0ULA and Alma VK3PIP is now VK3BAO. Congratulations on the upgrade, Alma.

Until next month, 73/33 — Joy VK2EBX.

AR

BEACONS

The present Australian 10 metre beacon sub-band contains six frequencies (inclusive) from 28.260 to 28.270MHz, as part of a world-wide network. To date five systems have been developed. These are: *Townsville VK4RTL 270; Sydney VK2RSY 262; Adelaide VK5WI 260; Albany VK6RTW 266 and Perth VK6RWA 264.* The sixth allocation, 268, has remained unused.

During February, the Darwin Amateur Radio Club Inc indicated their willingness to establish a 10 metre beacon. The request is currently being evaluated in the light of possible changes to the 10 metre beacon concept.

As previously reported in Amateur Radio, February issue, an agenda item discussed at the recent Region 3 Conference in New Zealand, proposed a change in frequencies and operation techniques for the world-wide chain of 10 metre beacons. The proposal is to replace the present, one service per channel, with the time sharing by many systems of a single frequency similar to the 20 metre beacons on 14.100MHz. These proposals will be discussed at the Federal Convention which will be held in Melbourne at the end of April.

In another beacon area, interest is increasing in the development of systems in the microwave region. To date, VK6RUF on 10.300MHz has been licensed in Perth. Notification has been received that it is proposed to develop both of the 10 and 24GHz units for VK2RSY, Dural. Information from operators of these regions would be most useful to provide guidance to both beacon constructors and band planners on matters like frequencies, antenna types (omni or directional) and polarisation, and the type of modulation. Your written comments via the Federal or VK2 postal addresses would be appreciated. The microwave bands are 2300- 2450; 3300-3500 and 5650-5850MHz; 10.000-10.500GHz and 24.050-24.250GHz. New Zealand currently operates two beacons on 10.275 and one on 24.100GHz.

There is a matter of concern to some repeater groups, particularly in Sydney, re the paging network which has developed in the spectrum from 148-150MHz. The repeater inputs for systems in the 147 segment have their inputs at the top end. Various levels of interference occurs to some repeaters. The matter is under investigation in New South Wales. A report will appear in a future issue of Amateur Radio.

Contributed by Tim Mills VK2ZTM
F.T.A.C. Beacon Co-ordinator

Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Another domestic shortwave broadcasting service commenced on the 20th February 1986. It is In the ABC Northern Territory Service, with three transmitters which are located at Alice Springs, Tennant Creek and Katharine. Each sender is designed to cover about 450 square-miles, designed to overcome the gaps in coverage within the vast expanse of the Northern Territory, with a vertically polarised tropospheric-scatter array.

NOT A 24-HOUR SERVICE

Programming will mainly come from the MW Service, plus specific programming for the Aboriginal community. At present, only the Alice Springs transmitter is operational. To take account of propagational variations, the senders will drop down to a lower frequency during the hours of darkness.

The present schedule is as follows:

VL8A Alice Springs	*4.835/2.310MHz*
VL8T Tennant Creek	*4.910/2.325MHz*
VL8K Katherine	*5.025/2.485MHz*

Contrary to what has previously been published elsewhere, the Service will not be a full 24-hour service, as the MW Service is at present. Because of budgetary restraints, the service will close down at mid-night Central Standard Time.

LIMITED EXTERNAL SERVICE

Yet another nation is reportedly embarking into external broadcasting — Zimbabwe has notified the IFRB that it Intends to commence broadcasts to the Far East, Africa, Europe and the Americas shortly. When the country was known as Rhodesia, there was limited external service to relay their viewpoint at the height of the blockade against Rhodesia in the 60s and 70s.

United Nations Radio, in New York, has gone silent recently. This is due to the increase in rental of the VOA transmitters. I believe that programming from UN Radio continues, with tapes being sent to other broadcasters to include in their programming.

SIGNAL STRENGTH GOOD

Recently I came across a new country on shortwave. It Is Syria and although It has been operational for a number of years, it happened to be the first occasion I have heard it in English. It is very easily heard as it is on a non-standard allocation of 7.455MHz from 2100UTC, in English, with very good signal strength.

Another Middle Eastern country coming in well is Iraq. Baghdad Is very clear on 13.700MHz and transmits, naturally, in Arabic. It is also on 9.610 and 9.745MHz in parallel. The best time to listen is around 0500UTC. The country is still engaged in a prolonged conflict with Iran and its programming reflects this fact, with frequent battle-sounds interspersed in the music and announcements.

LINGUA FRANCA

I do find it somewhat difficult identifying Arabic speaking stations. As it is the lingua franca for the region, naturally the majority of programming reflects this. Some do have English, or French broadcasts, yet their diction is often extremely difficult to comprehend. This is readily understandable, as the use of English or French is not as widespread, as with other regional areas. Also some nations are trying to reduce western Ideas and practices, particularly where there is a strong Islamic fundamentalist support. Hence, there is a strong incentive to concentrate on Arabic or other regional dialects.

DIFFICULT TO LEARN

Arabic is a particularly difficult and complex language to learn, but fortunately there are some identification aids available to assist the DXer. There have been language identification tapes made for HAP-USA, by Radio Netherlands, and some DXers. These contain identification announcements in various languages and dialects.

Many international and domestic services employ Interval Signals or signature tunes, to readily identify the station or program. Our own Radio Australia is easily recognisable by *Waltzing Matilda* which is played on a synthesiser. Other broadcasters also have different Interval Signalss for specific broadcasts/programs. For example, the BBC World Service is well- known for the sounds of *Bow Bells* which are familiar to any Cockney. For their European Services a synthesiser plays V . . . —. This was used In WWII on broadcasts to occupied Europe, when it was played on a kettle-drum. For other services, the synthesiser plays the notes BBC.

OTHER IDENTIFICATIONS

Most should be readily familiar by now with Radio Moscow's Interval Signals as well as other Soviet stations. Yet some interval signals have a similar sound; eg all Indian Radio and Radio Pakistan. I often still get caught because of the almost identical Interval Signals. It does take practice to tell the difference. I believe the Radio Bangladesh also had similar Interval Signals to the above, but I think they have since altered it. Others, such as Radio Beijing, have a separate Interval Signals at the beginning and the conclusion of their scheduled transmissions.

HELPFUL EDITION

An indispensable aid to the DXer or SWL is the World Radio TV Handbook. The 40th Anniversary Edition was recently published. The cost has increased to around $A38, although some who ordered through bulk ordering were able to reduce this a little. This 609 page book has all the regular features, listed by country, with stations, broadcasting organisations, and transmitter sites included. There is also an article tracing the history of the WRTH from 1946 right up to the present day.

There have been improvements in layout, making it a little easier to rapidly find the country or region. A valid criticism has been that by the time it has been published, some of the information is obsolete. This is unavoidable, as the virtual explosion of stations and broadcasters in the past 15 years has made it difficult to compile an accurate schedule, right up to the deadline. Fortunately, the WRTH publishes supplements coinciding with the seasonal frequency alterations in March, May and September.

For further information about the book write to PO Box 88, DK-2650, Hvidovre, Denmark.

Until next time, the very best of listening and 73, Robin VK7RH.

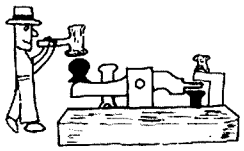
AR

Eric Trebilcock L30042, joined the South Australian Division of the WIA in April 1930. Eric was admitted as "Associate Member No 5". He transferred to the Victorian Division in 1949.

When Eric joined the WIA R B Caldwell was SA President, D R Whitburn was SA Secretary. Federally, H K Love was President and Bruce Hardie was Secretary.

Eric, and his late wife Gene, conducted the VK3 Inwards QSL Bureau for many years and Eric was granted Life Membership of the WIA in recognition of his services to the Institute.

Eric, and his bride Aline, have just returned to Victoria after an absence of five months and one can be assured Eric will be "tuning around the CW bands".



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

It was a pleasant surprise to see the wealth of CW-related material in the January issue of *Amateur Radio*. Although, on second thought, the news that the International Maritime Organisation (IMO) plans to phase Morse out in favour of digital communication systems rings a few alarm bells. There are parallels with amateur radio, insofar as those with the dollars will undoubtedly benefit by having *easier* means of communication, while those who cannot afford the state-of- the-art equipment will, inevitably, suffer from degraded service; those who understand radio and the capabilities of CW will be scorned by the button-pushers.

The move appears, at first sight, to make sense — but it begs a lot of faith in some fairly advanced technology. We all know the risks that go with anything that is automatic, or operates at the touch of a button. I just spent two nights stripping-down an *automatic* washing machine, which had a broken gear. At least it was capable of being fixed, assuming I can obtain the replacement gear from Sydney.

Most of us who have sailed the high seas at one time or another would, I suspect, feel a lot safer if there is a competent Morse operator on board, with suitable (if simple and inexpensive) equipment.

It is interesting to note, however, that the IMO has sense enough not to impose Cinderella technology by programming maritime computers to communicate in Morse code! (unlike some amateurs, I know).

If I can be pardoned for changing course by a few degrees, *What's Your Problem?* in an Adelaide morning newspaper are still dispensing wisdom (remember the two-prong to three-prong voltage adapter?). This time a reader asked about the last use of Morse telegraphy in South Australia and Australia. The South Australian part may have been right — Kalangadoo to Adelaide on Saturday, 3rd March 1962, but I don't think the "last Morse code message In Australia was between Roeburne to Onslow and Wittenoon Gorge, Western Australia, in November 1968". According to Jim Linton VK3PC, December AR, the last Morse telegraphy link in Australia, to Lord Howe Island, did not close until 1975. I wonder what the last message was . . .

One would suspect that the Lord Howe Island link was by automatic-machine Morse, and perhaps the WA link was, as well. Any further information on the last **manual** telegraphy links would be appreciated (quoting sources, if possible).

The January edition of this column described semi-automatic mechanical keys in some detail, but did not say much about fully automatic (dot and dash) devices. I apologise for the oversight — I had intended to say that they were never very popular because they were extremely complicated mechanically, expensive and usually could only be used at one speed. In fact, I have never seen one, but my friend, Tom Laidler VK5TL, rang to give me some more information on a locally produced model and invited me to have a look at it. He agreed with the reasons I put forward for their general lack of popularity, but pointed out that there was always a small market for them.

Tom says a fellow by the name of Norman Thomas developed one in Adelaide in the 1920s. The parts were made by Hitchcox Brothers, and Mr Thomas personally set-up and adjusted each one before shipment. He sold them all over Australia, at a price of 50 pounds ($100 in decimal currency). They were fixed at one speed, around 20WPM I think Tom said. (Do any other VK amateurs possess one of these units. Ed).

Tom began his career in PMG telegraphy, in 1918, which gives him a wealth of experience to speak from.

To conclude the column this month, I would like to share with you some fascinating information my eight-year-old daughter showed me in the 1985 edition of the *Worldbook Encyclopedia*. It is their definitive article on Morse code . . .

"Morse code is a system of dots, dashes, and spaces that telegraphers in the United States and Canada once used to send messages by wire. The code was named for Samuel Morse, who patented the telegraph in 1840. The letters that occur most frequently in our language are represented by the simplest symbols.

"The dot is made by quickly pressing and releasing the key of the telegraph sender. This produces a rapid 'click-clack' sound in the receiver at the other end. A short dash is twice as long as a dot. A long dash is equal to four dots. The space between the dots and dashes that make up a letter is the same length as a dot. The space between the letters of a word equals three dots. A space that is part of a letter combination equals two dots.

"For years, all telegraph messages and most news were transmitted by Morse code. Now, most such messages are sent by automatic facsimile and printing telegraph machines. Radio and telegraph operation in other countries once used International Morse Code, also called International and Continental Code. But facsimile and printing methods of sending messages are now more widely used".

73 and "click-clack" until next month.

AR

Radio Amateur Old Timers Club

HUNTER BRANCH DINNER 1960

The accompanying photograph was taken at the Hunter Branch Dinner in October 1960. The photograph features, from left: Dave Duff VK2EO, Federal Councillor VK2 Division; Gordon Sutherland, Branch Secretary; Lionel Swain VK2CS, Branch President; Wal Salmon VK2SA, Metropolitan Police Supervisor; Bill Lewis VK2YB, WIA President; George Riley, NSW Superintendent of Radio with the Postmaster General's Department; Max Hull VK3ZS, WIA Federal President; Allan Fairhall VK2KB.

Photograph courtesy Newcastle Herald & Sun Picture Service

CHANGE OF RAOTC NET CO-ORDINATOR

Lay Cranch VK3CF, has spent seven years as co-ordinator of the RAOTC broadcast net. Due to indifferent health, Lay has resigned from his position which will be taken over by Mac McConnell VK3RV, as of the April Official Broadcast.

The success and popularity of the net operation has been due to Lay's dedication and we say a big thank you to him for his devotion to the task. He continues to be interested in the work of the RAOTC by taking over the less onerous task of VK3 Liaison Officer.

DONATIONS

In order to continue with the publication of the RAOTC journal, *OTN*, it has been necessary to obtain some finance by donations from members. Thanks are extended to those who have made donations — some on more than one occasion. A list of donors will be published in these columns in a future issue of Amateur Radio magazine.

HEADQUARTERS ANNUAL DINNER

The annual dinner of the RAOTC was held on 6th March 1986, at the City and Overseas Club, 291 Dandenong Road, Windsor. The evening commenced with pre-dinner drinks at 6.30pm, moving on to dinner at 7pm.

At the Victorian luncheon in September 1985, members were entertained by Chris Long, retired Assistant Electronics Curator of the Melbourne Museum, who gave an exciting screening, with sound tracks, of slides of the early history of RF transmissions and sound reproduction.

Chris was prevailed on to present another, different show, for the dinner.

RAOTC SECRETARY RESIGNS

It is with sincere regret we advise the retirement of Harry Cliff VK3HC, from the office of Secretary/Treasurer of the RAOTC of Australia. Indifferent health in recent months has precipitated Harry's decision.

As the inaugural Secretary and Treasurer of the Club, Harry has devoted a decade of time and energy to the Club, ably assisted by his wife Melda. Out thanks are extended to them both with the fervent wish that they be spared to enjoy many years of the bracing air at Point Lonsdale, from where so much of the official office work has emanated for the past 10 years.

Harold Hepburn VK3AFQ, has kindly taken over from Harry and we welcome him to office. Please take note that all future correspondence should be addressed to Harold at 4 Elizabeth Street, East Brighton, Vic. 3187.

RAOTC TENTH BIRTHDAY

1985 celebrated the first ten years since the inauguration of the RAOTC, in 1975. Over this time, our membership has grown from under one hundred members, to over 800. Our formation was the brain-child of Bob Cunningham VK3ML *"to maintain interest and fellowship amongst amateurs who had held a license for 25 years or more"*.

Our steadily increasing membership, despite the inevitable Silent Keys, indicates there is a place in the scheme of things for such an organisation of Old Timers.

The RAOTC publication *OTN*, is issued annually to keep alive the stories, artifacts and amateur activities of those many decades when amateur radio was very much a 'do-it-yourself' hobby.

HOW TO JOIN THE RAOTC

Eligibility for membership is available to amateurs who have held, or been qualified to hold an amateur radio licence for a period of 25 years, or more.

Its objectives are to maintain interest and fellowship among the older licensed amateurs. It is affiliated with the Wireless Institute of Australia.

The joining fee is $15 for Australian amateurs, or $20 for overseas applicants, which should be submitted to the Secretary, Harold Hepburn VK3AFQ, 4 Elizabeth Street, East Brighton, Vic. 3187, together with the following information;

Date of original licence, Operator's Certificate number, Original Call Sign or qualification held, Present Call Sign if original not now held.

An application form is available from the Secretary at the above address. It is required to be signed by a proposer and a seconder who are already RAOTC members.

Membership is only paid once! It entitles members to participate in all RAOTC on-air nets, social functions and a copy of the journal *OTN*. Members also receive a Club badge as part of the 'once only' fee. Donations may be called for occasionally to cover operating costs.

RAOTC QSO PARTIES

Two QSO Parties are held each year for members of the RAOTC and the Old Timers' Club of New Zealand.

Eligibility: The Parties, in the form of contests, are open to members of the RAOTC and the OTC New Zealand. Please note that there are members of the Australian Club in overseas countries, particularly the USA, who could possibly participate at the times laid down.

Contest Exchange: Members will exchange their Club membership number — VKs prefixed by **A** and ZLs prefixed by Z; Year of first license; Name; Age' *eg Nr A256 1961 Bill 49 — Nr Z128 1923 Harry 78.*

Scoring: One completed contact with a member on CW or SSB (but not both), will score five points.

Multiplier: The total of VK/ZL and overseas call areas contacted will be used as multipliers.

Final Score: Contact points times multiplier.

Dates, Times and Bands: The first event is held on the second Monday in March from 0200 to 0500UTC on 20 metres. Centre frequencies — CW 14.050 and SSB 14.150MHz.

The winter party has previously been held on 40 metres, but after poor conditions during 1985, the ZLs have suggested operation on 80 metres for a trial period during 1986. To obtain an opinion as to which works best, there will be two events in succeeding weeks.

The second event is held on the second Monday in August from 0800 to 1100UTC on 40 metres. Centre frequencies — CW 7.035 and SSB 7.100MHz.

The third event will be held on the third Monday in August from 0800 to 1100UTC on 80 metres. Centre frequencies — CW 3.520 and SSB 3.650MHz will be used.

Dates for the 1986 events are 10th March and 4th and 11th August.

Entries: Will show claimed scores indicating mode (CW, SSB or CW/SSB), number of QSOs and multipliers, preferably with a list of calls. This information should be forwarded to John Tutton VK3ZC, 11 Cooloongatta Road, Camberwell, Vic. 3124, as soon as possible after the first and third events.

A suggestion has been forwarded by the ZLs that the 'Exchange' be altered from the present numbering format, as above (A256 1951 Bill 49), to Nr. A256 Bill 5149, ie the final four-figure group being a combination of the year of the first license, 1951, and age, 49.

Would you please give an opinion on this suggestion and forward it with your log for the March Party.

AR

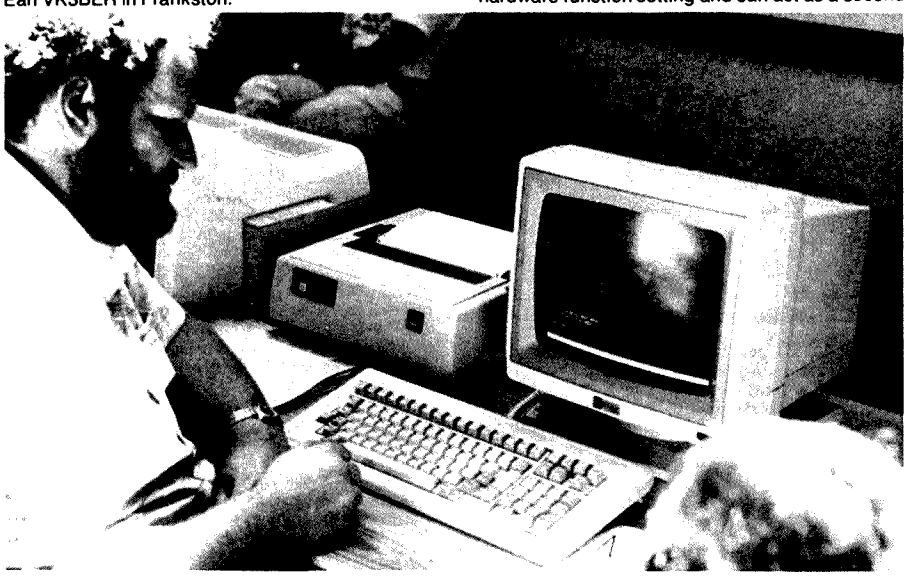
BEACON HELP WANTED

It is intended to increase the VK2RSY network of beacons. The next frequencies to be introduced are the 10 and 24GHz bands. Opinions from those who work in this region would be most welcome as to suitable frequencies and polarisations. Please write to the VK2 Division of the WIA, Box 1066, Parramatta, NSW. 2150.

Club Corner

PACKET RADIO AT THE BENDIGO CONVENTION

The Melbourne Packet Radio Group attended the Bendigo Convention on 16th February 1986, and set up a demonstration station. They were able to link into the Melbourne area via a digital repeater that was set-up on Mount Macedon for the day. Links were made to the AM-NET BBS System and Earl VK3BER in Frankston.



Peter VK3AVE.

Attending Bendigo were: Richard VK3KCO, Peter VK3AVE, Ian VK3KRI and David VK3YDF John VK3ZVR and Mike VK3YBM, were the Mount Macedon link whilst Earl VK3BER and Peter VK3AZQ provided the Melbourne link.

The whole exercise was a resounding success as was anticipated. A few minor problems occurred such as when a plug was knocked out of the wall in St Albans, and the antenna at Bendigo fell onto the roof.

During the day, Jim Linton VK3PC, at the Convention in Bendigo, and Earl Russell VK3BER, were heard chatting through the repeater.

Much interest was generated amongst the people viewing the demonstration at Bendigo. Visitors to the Convention attended from Ballarat, Shepparton and Albury districts and it is hoped that Packet Radio operations will begin in these areas in the near future.

The Melbourne Packet Radio Group formed into a club in January 1986, as sufficient members became available, and during the year the club will be attending many coming events similar to the Bendigo Convention.

The club's digital repeater is now permanently located at Broadmeadows, and covers the greater part of Melbourne and is workable as-far-afield as Geelong and St Leonards. Reception reports of the repeater, heard on 147.600MHz at 15 minute intervals using 1200 Baud data transmissions, would be most welcome.

For further information about the club write to Melbourne Packet Radio Group, Box 299, St Albans, Vic. 3021.

Contributed by Richard Donaldson VK3KCO
AR

SYDNEY AMATEUR DIGITAL COMMUNICATIONS GROUP

The Vancouver Amateur Digital Communications Group has recently announced the availability of the new revised VADCGG Mk2 Terminal Node Controller for use in amateur packet radio communications. This TNC is based on the original VADCG TNC, produced in 1979 and includes some of the standard features such as 8085 CPU, 8273 HDLC, and 8250 UART. It has remained at the same physical size to allow retrofit of existing Mk1 units.

Some of the new features are 64 kBytes of 2764/6264 ROM/RAM configurations, allowing optional downline loading of TNC software, provision of battery back-up of CMOS RAM, which enables storage of user dependant terminal control parameters. The terminal also provides circuitry for on-board switch mode power supply, enabling operation from a 12V supply.

There is provision for use of a 8255 PIA for hardware function setting and can act as a second terminal port, along with the standard DB25 connectors providing RS232/V.24 signalling to both terminal and modem ports.

The Mk2 TNC board and documentation can be ordered from the VADCG, 9531 Odlin Road, Richmond, BC. Canada, V6X 1E1, for Can$50, plus Can$5 postage and handling, the Intel 8273 HDLC chip can also be obtained from them for Can$50, plus Can$5 postage.

The Sydney Amateur Digital Communications Group will provide the software support for the VADCG Mk2 TNC, including the SADCG Master/Monitor software which provides a menu driven system for both Vancouver V2 and AX25 protocols in 2764 EPROMs.

In conjunction with the Mk2 unit, the SADCG provides a 7910 radio modem PCB which uses the AMD7910 world modem chip providing various Bell and CCITT AFSK modem frequencies and interfaces to the TNC via a DB25 connector. The PCB and documentation is available for $20 plus $2 postage from SADCG, PO Box 231, French's Forest, NSW. 2086.

Total construction cost for the TNC is approximately $250 and the modem is approximately $100.

Both VADCG and SADCG are non-profit, volunteer organisations involved in promoting development of amateur packet radio systems throughout the world.

AR

MARAC

The Marine Amateur Radio Club was formed in June 1985, to join past and present members of the Royal Netherlands Navy who are active amateurs, or are interested in radio. In less than six months MARAC grew from 40 to 120 members. A special Award has been instituted and copies of the rules may by obtained from John Aarsse VK4QA (MARAC 44), PO Box 211, Nambour, Qld. 4560 (SASE please).

Former members of the Royal Dutch Navy, civilian or military, are encouraged to join. MARAC is an associate member of the RNARS and will use, for the present time, 14.190MHz, the RNARS calling frequency, as a DX calling frequency. For further information write to: The Secretary MARAC, G7CW7CN van der Voort PA3DKZ, Burgemeester Warnerslaan 5, 1761GE, Anna Paulowna, Netherlands, or contact John VK4QA.

MARAC also publishes a quarterly journal, which is truly international, as articles are printed in Dutch, English and German.

Contributed by John Aarsse VK4QA
AR

SIERRA DELTA ALPHA RADIO CLUB

The Sierra Delta Alpha Radio Club has been formed. Membership is open to all members of the Seventh Day Adventist Church who have a licenced call sign.

The objectives of the Club are to provide opportunity for Christian witness; radio contact fellowship; better on-air procedure and monitoring in cases of emergency, etc.

Whilst the Club President, retired pastor Bill Turner, is mobile around Australia inquiries should be directed to: *Les Green, Secretary SDA Radio Club, Unit 36, Adventist Retirement Village, Victoria Point, Qld. 4163. Telephone (07) 207 8395.*
AR

NORTH WESTERN BRANCH

Meetings are held on the second Tuesday of each month at the Penguin High School, beginning at 7.30pm. Activity and club station nights are held every second Friday, same location, 8.00pm. Visitors are always welcome. Club call sign is VK7NW and postal address is Box 194, Penguin, Tas. 7316.

Interests within the Branch include HF operation; ATV; Special Communications; Antennas and Computing.

Further information may be attained from the President VK7KAB, the Secretary VK7AH, or VK7s WP, KDR, MB.

AR

DEVIL NEWS from the NORTH WEST

The last meeting of the Branch got off to a very good start with 24 people in attendance and two visitors.

Camp Quality (see last column), will be held from 8-14th December and discussions of the requirements needed for communications have been discussed. Communications will be from Penguin to Ulverstone and Kimberley to Ulverstone, with a station on air at the camp during the week. Assistance will also be required to provide a video of the days activities for resting children to view. The local Apex club is also taking part in the video venture.

Club members assisted with communications for the Boys Brigade Billycart Derby, held on 22nd March. VK7s WJ; ZPT; ZBT and ZHA donated their time to this cause. Assistance was also provided for the Horse Club Trials during last month.

Andrew VK7ZAP, has been constructing two diplexer units and the Branch was asked to consider an extension of the allowance to build another five filters for installation at a special communications repeater on Mount Duncan, and also the Lonah repeater. The money was made available for Andrew to conclude his good work.

About 83 QSL cards were received for the month and 30 were dispatched.

Visitors to Tasmania are advised if they put-out a call on Repeater 3 and do not receive an answer do not despair. During the day not many people are around as most operators work, but don't stop trying — we would like to talk to you.

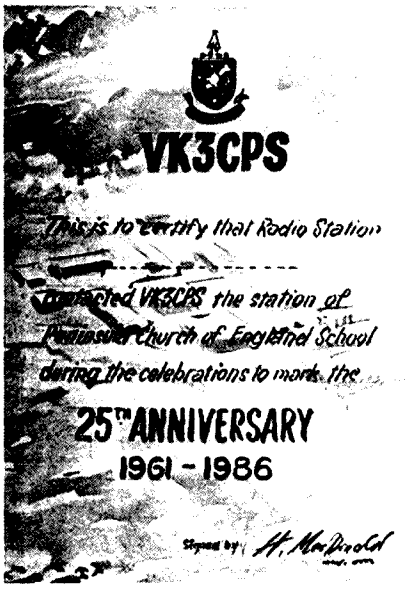
Broadcast Officer Frank VK7FH, has advised that Broadcast Rosters are being produced, whilst the Fund Raising Committee has got off to a very sluggish start but the ideas are there for bigger and better things to come during the coming year.

Ideas were put forward by the President, of ways to promote the Branch and amateur radio to schools and the public in the hope of stimulating new Interests in radio.

The Clanger Award for this month, was presented to Jack VK7WJ.

The evening concluded with a video of a power station on the mainland which was filmed by Jack VK7WJ, during his holidays in 1985.

Contributed by Max Hardstaff VK7KY
AR

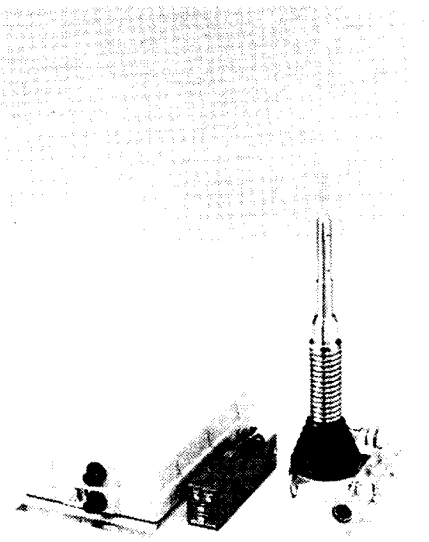


PENINSULA SCHOOL AMATEUR RADIO GROUP

To celebrate the 25th anniversary of the founding of the Peninsula Church of England School, the Peninsula School Amateur Radio Group, VK3CPS, intends to activate the school radio station throughout the 19th April 1986. All stations who work VK3CPS will receive, without cost, a special certificate to mark the event. The certificate is high quality, in two-colours and measures 160mm by 200mm.

Contributed by Steve Curtis VK3CAX
AR

A R Showcase



DIGITAL ANTENNA SYSTEM

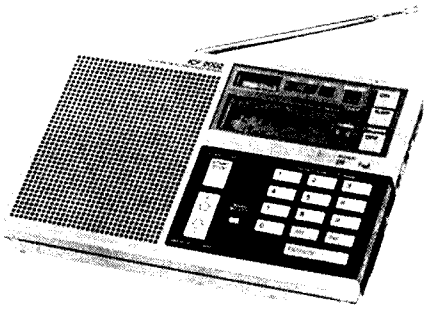
Reliable antenna matching for frequencies between 3.5 and 30MHz can be achieved using the new Icom AH-2 digitally controlled antenna tuning unit. The unit has been designed for mobile applications where broad band antenna matching has traditionally been a problem. It consists of a control unit that resides beside the radio and a tuning unit that mounts close to the whip antenna supplied.

The operator selects the desired frequency and pushes the TUNE button on the control unit. An on-board CPU selects the most favourable LC combination for the given length of whip antenna and the frequency. Worst case tuning time is 20 seconds, but typically the time is about four-to-five seconds. Maximum input power is 120 watts. Unlike normal tuners that require full output power during the tune-up period, the AH-2 derives the frequency information direct from the transceiver during use. Just 300mW of power is used for a very short time to check the tune L/C mix selected by the CPU. An in-built memory system allows up to eight pre-selected frequencies to be stored which allows a tune-up time of one second, or less, on these frequencies.

The tuning unit assembly is constructed in a tightly sealed plastic case to provide a dust and water-proof environment. Mobile antenna mounting is made extremely easy by the use of a clever bracket which utilises the the towing-hook located below most vehicles.

Icom (Australia) Pty Ltd, situated at 7 Duke Street, Windsor, Vic. 3181, ph (03) 51 2284, will provide further data upon inquiry.

AR



GLOBAL RADIO BROADCASTS TO THE WORLD IN STEREO

H D Norman, a 34-year-old Alabama native from the city of Opelika, is launching a new world-wide HF stereo radio station which he hopes will capture listeners from Australia to Zaire, and all countries in between.

NDXE Global Radio (pronounced *In Dixie*) has been several years in the making. Norman, who began as a radio station record librarian 28 years ago, conceived the idea with the late John Herbert Orr, who produced the first US manufactured magnetic recording tape and the Orrox CMX Video Editor.

As the world's first privately-owned HF stereo station, NDXE will offer programming that is totally different from the VOA, BBC, and other government-operated shortwave stations. NDXE's programs will feature live concerts, sporting events, world-wide phone-in shows, news, international weather and music by the world's popular recording artists — no political rhetoric.

Although HF transmissions have not been considered a viable medium for broadcasting "concert-hall" quality music, NDXE's super power 100kW stereo shortwave transmitter and 30m (100') rotatable log periodic antenna will deliver over three-million watts of power. Broadcasts will be beamed to the Pacific, Europe and the Americas.

NDXE will introduce a new measure of advertising, the Global Advertising Unit, which international advertisers can use to blanket the advertising message across all continents or to target a specific region. In addition they will operate a massive mail order business — listeners will be able write or call the station to order goods from jeans to refrigerators.

Norman is brimming with ideas to attract listeners and is offering bumper stickers, license plates, coffee mugs, etc. Special listener prizes will also be offered. For instance, since SWLs collect QSL cards, NDXE will offer one — a 3D holographic card!

It is anticipated NDXE will begin operation on 4th July 1986, and Norman is hopeful of attaining the services of President Reagan to throw the first switch.

Further information may be obtained by writing to NDXE Global Radio Headquarters, PO Box 569, Opelika, Al 36801, USA.

AR

SCALAR INDUSTRIES

The Scalar B20 lightweight VHF dipoles for 156-162MHz, are completely enclosed in a tapered fibreglass radome for complete protection from corrosion and precipitation static and do not require a ground plane.

The B20D is fitted with a fold-down bracket for deck installations and enables the antenna to be lowered for stowage.

The B20M is fitted with 100cm of anodised aluminium tube, and is suitable for mast mounting on board, or as a low cost shore base antenna.

The B20S is a light-weight variant suitable for single-hole mounting, whilst the B20G is a 3dB gain antenna suitable for base antenna applications.

The bandwidth is 6MHz, VSWR less than 1.5:1 and is terminated with three metres of RG58/CU.

• • •

Scalar also have a comprehensive range of professional audio connectors, plugs and sockets, including 3.5mm and DIN connectors, 2, 3, 4, 5, 6, and 8 pin microphone plugs and sockets, in-line and panel-mount plugs and sockets, power terminals and connectors, TV and radio plugs and sockets, also fuse holders.

A range of wire also available includes speaker wire, DC power cable, microphone cable and hook-up and multi-core cables in various colours.

• • •

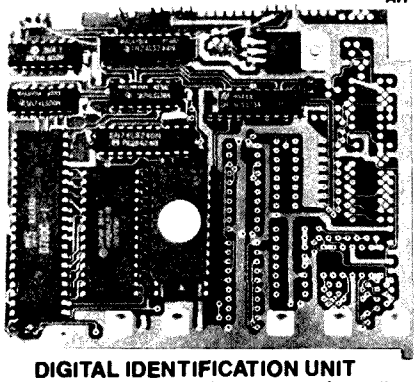
The ARRA Microwave Training Kit, MT-1, has been designed for Military, College, Industrial and Vocational training courses in microwave theory and applications. The kit is a complete course in

itself and is intended for use by people who have little or no background in microwave theory. Its prime function is to introduce the concepts of microwave theory and propagation, and the components used in the transmission of microwave energy.

The kit comprises three electronic components, 16 waveguide components and an assortment of accessories including an easy-to- understand training manual, and operates on 8.600-9.600GHz with a 2K25 Klystron and RG67/U waveguide components, powered by 110 volts, 60 cycles AC.

For further information in reference any of these products please contact Scalar Industries Pty Ltd, 20 Shelley Avenue, Kilsyth, Vic. 3137 or phone (03) 725 9677. Branch offices are in Sydney, Brisbane and Perth.

AR



DIGITAL IDENTIFICATION UNIT

Imark Pty Ltd have released an Australian designed Digital Identification Unit suitable for installation to repeaters or transceivers. It is a digital micro-processor controlled module featuring state-of-the-art technology and includes an EPROM for ease of programming. This allows the various parameters for Time Out Time, Identification Speed and Frequency, Identification Time and Identification Tone, etc, to be tailored to suit the consumers requirements.

While this module is primarily designed to plug into the option interface on SAWTRON KG105 transceivers, it is easily fitted to other repeaters or transceivers. Furthermore, additional software features can be provided upon request.

The unit weighs only 125kg and is supplied complete with mounting hardware and installation instructions.

Further details can be obtained from Imark Pty Ltd, 167 Roden Street, West Melbourne, Vic. 3003 or phone (03) 329 5433.

AR

QSP

STOLEN EQUIPMENT

The following amateur radio equipment has been reported, by the Melbourne Office of Emtronics, as being stolen.

The equipment is one IC-735, Serial Number 36304455 and one IC-290H, Serial Number 17703342.

If you are offered one of these items, or know of their location, contact Senior Detective Ewann McDonald on (03) 329 0000.

Also missing from New South Wales and Queensland is the following equipment.

Iris Bonsey VK4NME, recently suffered a house-breaking and lost her two metre Icom IC-2A hand-held — serial number 09665. This unit has great sentimental value as it was a gift from Iris' late husband. Any information on this unit would be greatly appreciated by her.

Graham Jones VK2CCK, has lost a Kenwood TR-7850 two metre FM transceiver — serial number 1111125.

Finally, Kevin Dawson VK2CKD, has lost an Icom IC-02A two metre hand-held — serial number 29901052.

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

"So this is Christmas". I have been hearing this song quite a lot recently as I am writing these notes just prior to Christmas. I would prefer to spend Christmas somewhere other than Buronga, but unfortunately I will be staying at home.

Christmas is a time when we all reminisce of Christmases past, particularly those spent in the presence of other amateurs who are now silent keys. This Christmas, I will listen to the voice of my brother (if I can find the tape), and my good friend Michael Leane, and an interview I did with him 17 years ago when he was a patient in the Mildura Base Hospital. *Isn't it wonderful how the modern tape recorder can bring us the voices of our departed friends.*

NO TAPE RECORDER

When I was on Morotai Island, during 1945-46, portable tape recorders hadn't been invented, and even the Army Amenities Broadcast Station 9AD (1440kc and 200W) used transcriptions to provide the troops with shows that had been recorded on mainland Australia. *Dexter* was a favourite with the troops, and *Spencer, the Garbage Man* was not only a character in the Willie Fennel Show to us, but we had a live-announcer by the same name on the staff.

Radio 9AD had two studios, a console for announcers with recorded shows and a large auditorium which was capable of being used as a dance hall as it could accommodate about 200 people. The radio station was fabricated from Sisalkraft with generous openings in the sides to afford some comfort in the high humidity of the area.

WATCHING THE FILAMENTS GLOW

The main transmitter, in fact the only one, was a RAAF unit which used four 813s as finals. Whenever I was in the control room I would admire the ruddy glow which the filaments from these tubes generated.

Christmas 1945, was a jolly time at the studios of 9AD. The war had been over for several months, and everyone was waiting to depart for home.

As mentioned earlier, the recorded entertainment came as transcriptions of shows that had earlier been broadcast by commercial stations, and when they arrived they still were complete with commercials. As 9AD was an Army station, we did not want to hear advertisements for toothpaste and boot polish, so it was up to one Sergeant-Major to monitor the disc the day before it went to air and note, with a chalk-mark, where the commercials began so the on-duty announcer could lift the pick-up over them whilst they were on-air.

LISTENING TIME

As the servicemen on Morotai had other duties rather than listening to their portable battery radios, and because the record library only had 2 000 discs, the transmitting hours of 9AD were somewhat restricted. We normally awoke at 6am to start the generators, put power to the transmitter, check the turntables and wake the duty announcer. The early morning program went to-air at 6.30am, and continued until about 9am. The next session was from noon o 1pm and again from 5.30 to 10pm.

On one particular morning, I started the generators and then decided to make a cup of tea before waking the announcer. I filled the electric jug, plugged it in and as soon as I threw the switch there was a flash. Ah-ha, I thought, there is something wrong with the jug, so I decided to pass on the cuppa and check the turntables instead. They would not turn, It was evident that a fuse had blown and I didn't know where the fuse box was — and on-air time was approaching fast. I made a mad dash for the chief technician's tent. With minutes to spare, he began to rectify the situation whilst I went to wake the announcer. The session went to air on time although the announcer was dressed in his pyjamas.

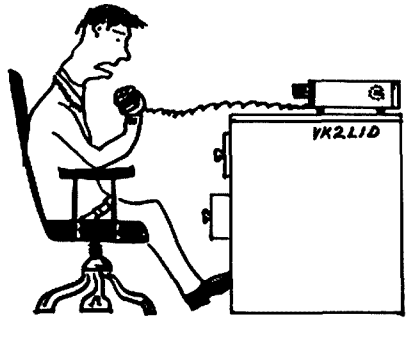
A HAPPY TIME

Christmas night 1945, was a happy time with the 9AD auditorium full of service men and women, many of whom rendered songs or played musical instruments over the air for those who could not attend. Many favourite songs were requested, some being Bing Crosby's *White Christmas, When you wish upon a Star,* and the Andrew Sister's song *Don't Fence me in.*

New Year's Night is another which is difficult to forget. The duty announcer was inebriated as he had had quite a number of bottles of alcohol with him in the studio. Visitors to the small studio began to annoy him and he ordered them to leave, but they were hesitant to go. As he played more and more records, and the visitors became louder and louder, the alcohol began to take over. He eventually pushed them all out the door and began to smash each record on the floor commenting as he went *"Now we've all heard that record so often that I'm sick and tired of it, so I'll smash it"*. All these proceedings were done with the microphone open so all could hear what he was doing. Eventually he had to be physically removed from the studio by another announcer. Listeners all over the island commented later that they had never heard anything like it.

73 for now and more about Morotai later, Joe VK2BJX.

AR



"Yes, OM — I said a horizontal vertical — We have just had a WIND-STORM!" — VK2COP

"By golly, OM — These new rigs are getting smaller all the time!" — VK2COP

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

NEW MEMBERS

The Division would like to welcome the following Now Members.

January: J Corben VK2EXT, J Dumont VK2NHH, P J Hampshire VK2NBT, A I Johnson VK2XEA, R T Lloyd-Jones VK2YEL, L A J Nickless VK2NDP, L S Porter VK2HB, J F Ranford, I S Wilkinson VK2PKB.

February: C E Aston VK2YH, P J Camilleri VK2CPJ, R J Clark VK2YOD, B J Crowe, D A Evans G3OUF/VK3FBG/2, C J Hynds VK2KLS, H Inoue VK2CEB, S Jensen, A R Oddy VK2NXK, R J Wing, P Witton VK2VPW, M F Veevers VK2BMV.

EVENTS FOR APRIL

These include the Annual General Meeting — 1400 hours on Saturday, 5th. Refer to separate posting for the details.

The Conference of Clubs Weekend will be hosted by the Orange ARC at Amateur Radio House, 109 Wigram Street, Parramatta, on the 19th-20th.

Details of these and other events will be broadcast on the VK2WI Sunday Broadcasts, 11am or 7.30pm.

BEACONS

On the evening of 17th January 1986, the VK2RSY 70cm beacon, on 432.420MHz was heard in New Caledonia. As previously reported, it is intended to increase the VK2RSY network. The next frequencies to be introduced are the 10 and 24GHz bands. Opinions from those who work in this region would be most welcome as to suitable frequencies and polarisations.

BROADCAST SURVEY

As these notes were being compiled, replies to the survey were still coming in to the Divisional Office. Thank you. A summary will appear in a later issue of these notes.

CALL BOOK

Now is the time for both clubs, groups and amateurs to upgrade any entries for the next edition of the Call Book. Please check your current entries and if amendments are required send them in now to the Divisional Office. If it is a change to an amateur call sign listing, send your original notification to the Department of Communications, PO Box 970, North Sydney, NSW. 2060, and a copy to the Division.

RO CONTEST

As noted elsewhere in this issue (in th Contest Column), a problem occurred which altered the placing first notified in the February issue of AR. The revised placing resulted in the VK2 Division being the winner for the second year running in recent times. Thank you to all who submitted their logs as well as those who advised the office during February, when the error occurred. The RD Trophy is on display at Amateur Radio House.

DIVISIONAL LIBRARY

Aub VK2AXT, reports that 1985 was another year of expansion in the library range, thanks to the many generous donations of books and magazines. There was one large donation of books which included many application data handbooks from the various solid state vendors. These were very much appreciated and should help those who build their own equipment or require alternate part replacements for that hard-to-get item.

A special thanks to the following for their donations — VK2s FDB; DGR; AYF; ZIG; CDM; YE; POT; JTD; ZSE; ADL; ZJC; AYB; DYM; CJP; ZF; CZX; PH; DYP; DF; BHW and EMC. There were also several anonymous donations.

During the year the cross reference listing was further updated and there are now in excess of 3 500 technical items cross- referenced from various amateur magazines. In addition, a library contents catalogue was started. Most of the books held in the library, the amateur magazines and some other popular magazines have now been included. Some if the older magazines and some loose-leafed material is still to be done.

When this is completed, the next task will be to list war-time and commercial/disposal type equipment and any modifications to them. Current equipment reviews will also find their way to the listings.

Members may make use of the listings by personal visits during the office hours of 11am to 2pm weekdays, and 7 to 9pm on Wednesday evenings. Alternatively, write to PO Box 1066, Parramatta, NSW. 2150, or ring during office hours. The best day to catch Aub is Tuesdays.

Donations, particularly books, are most welcome, so that we may keep adding to the reference range. If you find that you have to dispose of your own, or perhaps those in an estate, please contact the office first — they may be suitable to add to the Divisional Library. If we are unable to use them, one of the clubs, who have storage may be able to take them.

AR

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

PRESIDENT'S REPORT 1985

In presenting this Annual Report, I would like to thank all members of the WIA Queensland Division for their support during 1985, the 75th Anniversary Year of the Wireless Institute of Australia.

COUNCIL

Council members for 1985 were: *John Aarsse VK4QA, President, Ken Ayres VK4KD, State WICEN Co-ordinator, Dennis Breitkreutz VK4KEW, Member, Harold Bremerman VK4HB, Special Services, Bill Dalgleish VK4UB, Outward QSL and Club Liaison Office, David Jerome VK4YAN, Junior Vice-President and Minute Secretary, Theo Marks VK4MU, Honorary Secretary, Ross Mutzelburg VK4IY, Senior Vice-President and Alternate Federal Councillor, Paul Newman VK4APN, Honorary Treasurer, Bud Pounsett VK4QY, News and Information, Valerie Rickaby VK4VR, Service Liaison, Hugh Shaw VK4BHS, QSL Liaison Officer.*

Ex-officio Officers were: *Guy Minter VK4ZXZ, Federal Councillor for Queensland, Barry Ker VK4BIK, Publicity and Lecture Organiser for the General Meetings.*

Others, associated with Council operations were: *Dave Richards VK4UG, Membership Secretary, David Jones VK4NLV, Chairman Radio Club Conference 1985, Gordon Loveday VK4KAL, VK4 Intruder Watch Co-ordinator, Anne Minter VK4KZX, WIAQ Bookshop Manager, Jack Gayton VK4AGY, VK4WIA Station Manager, Murray Kelly VK4AOK, Inward QSL Manager, Ron Smith VK4AGS, Education Officer.*

Council met 13 times during the past year, using various locations as a meeting place. Initially, meetings were held in the new building of the Brisbane City Mission, the Valley. From May until August, meetings were held in the Training Department Rooms of the ABC in Toowong and, since September, in rooms of the Newmarket High School. Changing the meeting venue twice during the past year did not help the proper functioning of Council, as such arrangements which are essential for Council to operate in accordance with regulations applicable and acceptable to registered companies.

If surroundings are not up to standard, meetings tend to resemble Club Committee meetings and to attempt to force a meeting to adhere to rules is often interpreted as trying to *gag* or *stifle* meetings.

Council for 1986 has to look very closely into acquiring a more suitable venue for future Council meetings.

MEMBERSHIP

Early in 1985, Council awarded Life Membership of the Wireless Institute of Australia, Queensland Division, to **Frank Nolan VK4FN**, for his services to amateur radio in Queensland over a long period of time.

Due to his illness, the official presentation was delayed until Frank would have been well enough to attend a General Meeting. A date was finally set, but unfortunately Frank became a Silent Key one week before the presentation was due. A special presentation of the Life Membership Badge and the Citation was made to Frank's widow at her home *on the* day that Frank should have officially received the Badge.

A keen amateur and WIAQ member will be sadly missed.

Further comments on Membership are very similar to those made in my 1984 report — very few *students* became members, but join as soon as they have passed the various examinations and received a call sign. Also, unemployment caused a number of members to discontinue membership, while those on superannuation often found it hard to rejoin as they were not eligible to come under the *pensioner-rule*.

EDUCATION

Although no *Training the Trainer* seminars were held in 1985, Ron VK4AGS, liaised very closely with Brenda Edmonds VK3KT, Federal Education Co-ordinator, in the field of standardisation of examination formats for the various amateur grades. Thanks are also due to Guy VK4ZXZ and Ross VK4IY, our Federal Representatives, to bring this closer liaison about.

It is pleasing to learn that finally TAFE has agreed to include amateur radio on their technical hobby syllabus. This means that, providing suitable instructors are found, many more can study for the various licence grades at very reasonable rates.

VK4 QSL BUREAUS

Bill VK4UB, reported to Council on a number of occasions that there are still people trying to send QSL cards through the Bureau whilst not being a member of the WIAQ. The present system of including the AR address label with the QSL cards works very well and saves quite a bit of time. Close liaison between Dave VK4UG, Membership Secretary, and Bill, assist new members greatly when they are sending their QSL cards through the Bureau without the address label.

Murray VK4AOK, and his ever-growing band of helpers, including a computer, do a great job in sorting the incoming QSL cards. Now, if only amateurs in Queensland also co-operated, the job would be much easier. Too many just are not interested in receiving cards, or put the blame on the Bureau if they do not receive them, forgetting that they did not notify changes in call sign or QTH. The majority of the clubs co-operate very closely with Murray, but the odd ones spoil it.

An added problem for the Inwards QSL Bureau is the fact that nearly every country in the world has a different style of writing and often a V looks like a **U**, an F like a **T** and so on.

The WIAQ members can assist overseas or interstate QSL Bureaus by writing the addressee's call sign in large, readable BLOCKLETTERS.

NEWS AND INFORMATION SERVICE

This service continues to grow in popularity, with an increasing number of listeners from inter-state and overseas joining the HF call-backs. If there are complaints about the News Service as far as *news* is concerned, you the member can take the blame. If no news is forthcoming, there is just no news. This does not only apply to the Broadcasts, but also to QTC and the AR VK4 section. Thanks are due to the many volunteers who regularly operate as relay stations in the HF bands and, of course, the VK4WIA Station Manager, Jack VK4AGY, and last but not least, our regular News Reader, Bonnie Pounsett. The VK4 News and Information Service can now also call themselves the Award Winning News Service, as both Bud and Jack were honoured with the WIA 75th Anniversary Gold Medallion.

PUBLICATIONS

Anne VK4KZX, again did a magnificent job as WIAQ Bookshop Manageress, despite a serious illness which curtailed her activities in the Bookshop to a great extent for a considerable period.

The sales were not as good as in previous years, possibly because student numbers have dropped rather steeply. Other problems are similar to those reported last year, supplies from overseas sources are, to say it kindly, very erratic and, at times, very expensive in so far that the senders use the wrong delivery system, resulting in extra expenses such as wharf duties and so on. And the fall in the Australian dollar did not help matters either.

Postage costs are fortunately not as high as anticipated as many more clubs have discovered that they are helping both their own members, themselves and the WIAQ Bookshop by ordering in bulk.

INTRUDER WATCH

We repeat what was said last year:

The Sweat and Blood of so Few in Defence Against so Many Intruders

Regardless of the above, Gordon VK4KAL, reports the removal of several intruders, including interfering harmonic transmissions. But he also reports that he is still waiting for the promised reports from those clubs who publicly stated that they supported the IWS and would be sending in regular reports.

VHF UHF ADVISORY COMMITTEE (now QTAC)

This Committee of two, Brian Rickaby VK4RX and Paul Hayden VK4ZBV, saw its name changed to QTAC, Queensland Technical Advisory Committee, but still performed the same duties as under the old name. A number of proposed repeater applications were investigated, as were some special application repeaters, Liaison with the relevant DOC sections solved some problems and all applications were approved.

HISTORIAN

Alan Shawsmith VK4SS, and his wife have done a tremendous amount of research into the history of amateur radio development in Queensland. Many articles in Amateur Radio during 1985 showed the results, with the November issue as the crowning glory, so much so, that many contributions will have to wait for inclusion in future editions of Amateur Radio. The commemorative booklet is nearing completion, a bit after the promised date, but so much came to light that a constant revision was necessary. 1986 should see the publication of OUR BOOK. For his work over the past years in the field of amateur radio journalism, Alan was awarded the 1985 VK4 Merit Badge, which was presented to him by both the Federal President, David Wardlaw VK3ADW, and the Divisional President, John Aarsse VK4QA, in a ceremony at Alan's QTH after the conclusion of the 1985 Radio Club Conference.

AWARDS AND CONTESTS

The Queensland Award still attracts many *triers* and a number were issued during 1985. A problem looms in the near future with many Shires clamouring to become, for reasons unknown, fully fledged Cities. When this comes about, the rules will have to be reviewed very closely.

Our very own Jack Files Sunshine Contest continues to grow in popularity and the number of *interstate competitors* participating are a joy to he heart of Joe Ackerman VK4AIX. To stay on top, more VK4 participants are needed. This, by the way, also applies to the Remembrance Day Contest.

WICEN

WICEN continued to assist wherever there was a need for their services. In south-east Queensland, the hailstorm in January convinced some SES regional officers that extra assistance was needed under such circumstances. The Gold Coast and Redcliffe SES regions sought the assistance of local amateurs to become wardens and, by all accounts, these units operate quite satisfactorily, with the one from Redcliffe being the first to have acted under actual emergency conditions. This idea is worthwhile for other regions to investigate, especially the smaller communities not covered by large radio clubs in central and northern Queensland.

WICEN officers kept their hands in portable operations in all areas by assisting various organisations as communication personnel.

1985 also saw the publication of the Queensland WICEN Handbook, the result of extensive research by Ken Ayres VK4KD, and assistance from the many VK4 WICEN co-ordinators, officers and the VK2 WICEN organisation.

A number of WICEN officers and other amateurs in Queensland also assisted the Australian Third Party Network during the Mexico and Columbia disasters.

TREASURERS REPORT

This report will be issued separately and it should be noted that the surplus for 1985 is well below that for 1984. This is partly due to the present economic situation with very little surplus coming

onto the market. *Surplus Sales* is normally a money spinner for the Division. Also, booksales dropped markedly. There will need to be some serious work done during 1986 by Council to find ways and means to contain expenses and make any increase in membership fees as low as possible. One way in achieving this is, of course, more **members.**

But that depends to a great extent on present members to achieve. Regardless of the figures presented, our Honorary Treasurer, Paul VK4APN, has done a very good job considering the present economic conditions.

1985 RADIO CLUB CONFERENCE

Club motions were not as abundant as in previous years, so more time was spent on the incomplete Federal Motions. The Conference was further honoured to have as its VIP guest, the Federal President of the Wireless Institute of Australia, David Wardlaw VK3ADW, who, during the Conference, presented an interesting talk on WARC. Thanks again, from Council and Delegates, to all those who worked behind the scenes to make this Conference possible. And that includes you too, Delegates from all over Queensland.

SPECIAL EVENTS

The introduction of Channel 28 SBS-TV services in the Brisbane area caused a few problems to the SEQ ATV Group's Repeater, so much so that they featured on all television news services. However, the action taken by the SEQ ATV Group and its co-operation with the relevant authorities, actually raised the status of amateur television in the eyes of the industry and the authorities alike. Thanks SEQ ATV Group for a job well-done.

SEQ ATV Group stole the limelight again with their celebrations on 50 years of television in Australia, originating from the Tower Mill in Brisbane. Again, a good coverage, both in the written and visual news media, with a *national* coverage on the highly rated SBS TV News Service.

Three regional conventions took place during 1985, the BARC Fest in Brisbane, the North Queensland Convention in Townsville, and the Gold Coast Hamfest. All were very well organised, well attended and very successful. At the North Queensland Convention, which incidentally was telecast live by the Townsville ATV Group, I had the pleasure in presenting the second WIAQ Merit Badge for 1985 to Les Bell VK4LZ, for his long association with the North Queensland Amateur Radio Movement. Due to his work, many amateurs gained their licences and Les is still a great behind-the-scenes worker to assist amateur radio in North Queensland.

75th Anniversary Celebrations were held all over Queensland, each club doing their own local things. The work done by the Darling Downs ARC and Oakey are to be recommended as they brought amateur radio right into the limelight with good publicity in the local papers.

The culmination of the national festivities was the dinner in Melbourne which was attended by many international and national celebrities. Guy, as Federal Councillor and his wife Anne, were among those at the Melbourne Dinner. By all accounts, it was an event not to be forgotten very lightly.

At State level, Council faced a mammoth task to select 20 Queensland amateurs worthy to be recipients of the commemorative WIA 75th Anniversary Gold Medallion, A special committee was set up and its recommendation to Council, with minor modifications, was accepted. The list of those honoured is published in the January 1986 issue of *QTC.*

In addition to those listed, Guy VK4ZXZ and I received the Commemorative Medallion from the Federal President of the WIA.

FEDERAL REPRESENTATION

On behalf of Council and members I would like to express my thanks to Guy VK4ZXZ, the VK4 Federal Councillor, and Ross VK4IY, the VK4 Alternate Federal Councillor, for their tremendous efforts to keep up-to-date and to report regularly to the membership and Council, all the news forthcoming from the Federal Office in Melbourne, and from other Divisions.

Their work during the 1985 Federal Convention, in presenting our Division's viewpoints is greatly appreciated.

For his work, Guy was especially honoured to accompany the Federal Delegation to the IARU Region 3 Conference, in Auckland, New Zealand, the only non-Federal Official to be included. Congratulation Guy.

THE FUTURE

It is very difficult to gaze into the crystal ball and predict what is going to happen in the future in these days of rapid developing technical advancement. No attempt will therefore be made to make a prediction, except to say, amateur radio will face many exciting changes and challenges. And it is up to us all to be prepared to meet these changes and challenges ... ***united in the Wireless Institute of Australia.***

CONCLUSION

As I mentioned last year, due to certain circumstances beyond my control, I was again unable to visit many clubs, especially those in the regional areas. However, the North Queensland Convention provided me with a chance to meet with many members of clubs in the northern and central regions. Had I been in the circumstances as I am now, while writing this report, I would have been able to see many more clubs, especially those in the western regions.

It is my intention to make 1986 my final year as a member of the WIAQ Council. I have had a long innings, some 15 years, and it is about time that others will *volunteer* to serve on Council. There were times that I wanted to resign, but because of insufficient nominations for Council, many of the longer serving Council members were *volunteered* into continuing their term for the sake of amateur radio in Queensland.

Therefore, may I thank you all for your past support, you the members, the clubs, SES, the Department of Communications, Federal Executive, and my fellow Council members.

May 1986 bring further successes to this Division and to the Wireless Institute of Australia in general.

John Aarsse VK4QA
President, WIA VK4 Division.
AR

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

As you are probably aware by now, or will be by the time you read the *Silent Keys,* we lost our old friend and recently retired Divisional Historian, Jack Coulter VK5JK, on 26th January. What made Jack's death even more poignant was the fact that he was to have received one of the WIA 75th Medallions and he never knew. We had even arranged that Rowland VK5OU was going to deliver it in person to Jack at Daws' Road Hospital on the day of the WIA meeting when the others were to have been presented, 28th January.

Since then, I have spoken to Dennis, Jack's elder son, and after discussion with his brother Robert, who is in Sydney, they have decided that it would be a nice gesture for us to display the medallion in the Historian's Cabinet, in memory of Jack, which Council is very happy to do.

MARINE MOBILE

I hear that the activation of the VK5JSA call sign from Cape Willoughby Lighthouse and marine mobile from the ferry PHILANDERER was a great success and several of those involved are now getting writers' cramp from writing QSL cards and awards. I understand the elements were not very kind to Bill VK5FR/VK and Jack VK5FV, who operated marine mobile on the PHILANDERER for four days prior to the lighthouse activation. Not than an *Ancient Mariner* like Jack would admit to feeling the slightest bit sea-sick, but I gather that they were very glad to be back on dry land again!

J150 PLACINGS

The activation of the VK5JSA call sign also boosts people's scores for the J150 Award by 15 points at a time. The first 12 Awards have already been issued, which has taken away the fear that perhaps it might be rather difficult to achieve. There had to be a count-back to decide some placings as many were received on the same day. The order is as follows:

1 VK5SJ	7 VK3XB (1st all CW)
2 ZL1AQO (1st overseas)	8 VK2PLN (1st novice)
3 VK3ABO	9 VK3KS (1st YL)
4 VK5ZN	10 VK3AJU
5 VK2AKP	11 VK4VAT
6 VK3CQP	12 VK5AQZ

Congratulations to all the above, and it is nice to see that the three VK5s are all active on the nets or activities, they put in a great deal of time for the benefit of others who want to get the Award, not just for themselves.

DIARY DATES

11-13th April 13th Clubs' Convention (for those involved).
22nd April AGM.
29th April Buy and Sell.

AR

To be eligible for the Intruder Watch Award, you must contribute an Intruder Log. Send yours in now!!

VK3 WIA Notes

WIA VICTORIAN DIVISION

412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

The members and officials of the VK3 Division extends a warm welcome to the following new members.

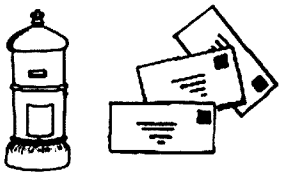
Noel Abel, F Clark VK3FC, Judyth Clarkson VK3NNT, John Couch, Philip Course VK3PHY, Maurice Cox, Raymond Curran VK3DQN, Ray Dean VK3POG, H Fauzy YB6MF, Michael Franck, Vincent Fournair VK3NSP, P Gardner, R Gomerski, Richard Griffiths VK3XRG, Hamilton High School VK3AHS, Andrew Harding, Arthur Henwood VK3NAH.

John Herrmann, R Jackson VK3CNJ, Edward John VK3BUJ, K Jones VK3XHI, Phillip Lewthwaite VK3CCV, Terence Morrison VK3DVZ, R Oldfield, Gregory Papworth VK3BYR/A92DY, Stephen Smith VK3XSS, Seiichi Tanaka JE6BYA, Richard Valentine VK3PTI, Art Van Esch VK3EO, Robert Williams VK3VOS, R Magilton VK3DRC, W Massey VK3PSB and G Manders VK3CGM.

NEW POSTAL ADDRESS

As of the 1st April 1986, the VK3 WIA Broadcast postal address will be *PO Box 440, Carlton South, Vic. 3053.* Members contributing to the Broadcast are advised to use the above address and please remember it is Carlton *South,* as correspondence with just Carlton in the address may not be delivered.

AR



Over to You!

Any opinion expreeeed under this heading is the individual opinion of the writer and does not necesserily coincide with that of the publisher.

CONGRATULATIONS VK2

While we would have liked to have been the winners of the 1985 RD Contest, we recognise that mistakes can happen and indeed we feel very sorry for Ian Hunt, who is undoubtedly most embarrassed. We hope such embarrassment stops with this letter.

Many things have been said, but the fact remains that we do not want to be seen as hollow winners upon some strict interpretation of the rules, nor do we want to see the results declared null and void so as to deprive the real victor of its trophy.

This division would like to support the spirit of the contest and therefore extends to the VK2 Division our heartiest congratulations. We will meet you all next time around, and if we win, we will deserve it.

VK1 Divisional Committee.
AR

CHALLENGE

I enjoyed reading the "challenge" in February issue! (Editorial). I appreciate the fine material in each issue and trust Amateur Radio will continue to have good support from all of us out here.

Sincerely,

Don MacLean VK2DON,
Box 280,
Ingleburn, NSW. 2565.
AR

MEMORIES

Roy Stephens VK4BRS, very kindly loaned me a copy of the November 1985, issue of Amateur Radio, as it contained mention of my days as VK4YL.

I found the whole article on pre-WWII days in VK4 very exciting as I recalled so many names and calls that were a part of our life then.

My father, VK4GK, was involved in many of the experiments with Arthur Walz VK4AW, Bill Harston VK4RY, Bill Wishart VK4WT and Nim Love VK4JL, and his Log Books read like a diary of those pioneering days.

Other amateurs mentioned in the issue who brought back many happy memories were Leo Feenaghty VK4LJ, Matt O'Brien VK4MM, Alf Guilford VK4AR Len Grey VK4LN, Herb Sholz VK4HR and Reg Vickary VK4RV, to name a few — and of course, Rev Delbridge VK4RJ — I recall his Sunday Morning Sessions. Then also, I read with avid interest about Eric Lake VK4EL and Roy Belstead VK4EI.

By the way, my father's initials were A H MacKenzie. He endeavoured to get the call sign 4AM, the 4AK, but was told that both were reserved for future broadcast stations, so he obtained 4GK, with the result that many thought his christian name started with G — but all called him "Mac".

Congratulations to VK4SS on his article, and thanks for the happy memories this publication brought me.

Yours sincerely,

Madeline Pugh (nee MacKenzie) ex-VK4YL,
5 Conrad Court,
Nambour, Old. 4560.
AR

REPEATERS — THE FUTURE

I wish to comment on the article which appeared in AR, February p8. Some ideas in the DOC paper quoted in this article concern me.

1 It suggests cross-linking be within the same amateur band. If this had been law in the USA, the following experiment would not have been possible. From Sydney, I have operated through several 10 metre FM USA repeaters which, in turn, were linked to a two metre repeater where I spoke with mobile and home stations, which in turn were linked to 70cm and I was able to converse with an operator in his garden using a walkie-talkie. This linking repeater experiment, which is an everyday occurrence in US amateur radio, allowed a walkie-talkie operator to achieve a contact half-way round the world. There is no reason to prohibit amateurs who wish to conduct such imaginative experiments, which push our service to the fore-front of new dimensions and capabilities which previously did not exist.

2 It suggests that 1300MHz be used for link frequencies. Many unused frequencies may exist on lower bands where licensees do not need to invest in new equipment.

3 It suggests cross-linking of repeaters should not provide access to stations in capital cities. In my opinion, all of the above points are un-necessary restrictions. Point three goes so far as to remove one aspect of radio communication experimentation from amateurs who happen to live in a geographic location presumably because they do not co-incide with the Department's idea of what repeaters are all about. What amateurs do on their bands should be an amateur matter and the Department should encourage all and any aspect of experimentation and not limit new innovations which the descendants of the original radio experimenters wish to attempt.

These severe restrictions only serve to create and encourage a purely radio-telephone system. Comparisons between amateur and commercial repeaters should be terminated.

No reason is given for not allowing individuals to hold repeater licences. In the USA individuals can hold such licences, so whether it be an individual or a group, I don't see why it matters. Whilst I agree with orderly development, this should not be used to hinder initiative and experimental motivation.

Use of repeater stations: Regulation 4.13 (a)Approval for a repeater depends on the requirement of a particular area and (b)Repeaters shall not be intended for long distance communications. I feel these guidelines should not exist for the amateur service because they intrude into the scope of experimentation which is possible with such systems.

I do not agree with the idea that says cross-band linking of a repeater should not be permitted where an amateur can originate a signal on a band he is normally permitted to use.

This virtually eradicates any ideas of linking possible 10 metre repeaters in Australia, an activity which has long been part of US amateur radio and was recently introduced in Canada. Such a consideration is really un-necessary as limited licensees have long been appearing on HF via amateur satellites. Furthermore, unlicensed newcomers can operate over HF under supervision so there should be no concern at the appearance of LAOCP's over HF on a 2 to 10 metre crossband repeater. This issue has lost all meaning in the USA where the FCC no longer allocates call signs which reflect the class of licence. In the USA, the ARRL, with its proposed updated novice licence, would allow 10 metre packet with a 10 to 20 metre gateway for novices, as well as a 10 metre to VHF/UHF gateway. Voice as well as data repeaters automatically identify all call signs, including relays involved, a feature not available over the satellite.

The idea that the maximum number of cross-linked voice repeaters should be three and that RTTY and Packet should have no maximum will limit experimentation. Voice repeaters should also have no limit.

On packet radio, the controllers being sold and built throughout Australia allows anyone to digipeat through your station even when you are in contact with someone else.

The American PK64 manual says, "It is common courtesy to leave your digipeater and equipment on while you are in the shack so that others who cannot contact you direct can digipeat via your station". YJ8RG would like me to digipeat him from 20 metres to 2 metres so that he can ask questions about packet radio from the experts on VHF in Sydney.

The PK64 allows me to do many things with packet radio, I hope the regulations will encourage, rather than restrict this.

Relaying between bands is legal in the US and we need to regain this right (this right was removed in 1977 and has since restricted activities).

Linking cross-band; repeating; automatic operation, unattended operation, remote control, digipeating — these should all be part of the individual amateur's sphere of exploration.

We need continued WIA participation with the addition of co-ordination of frequencies for the individual requiring temporary WIA suggested frequencies on which to experiment. We need to remove all un-necessary restrictions and give the WIA maximum flexibility so that frequency co-ordination involving any arrangement of the above can proceed so we achieve maximum benefit.

I would like to express my thanks to the FTAC article which has encouraged all amateurs to contribute their ideas and my thanks to DOC for presently seeking ideas and studying those issues.

Yours faithfully,

Sam Voron VK2BVS,
2 Griffith Avenue,
Roseville, NSW. 2069.
AR

PIRATING OF A CALL SIGN

In addition to my VK2 call sign, I still retain a South African call, ZS5MD, which I have held since 1949.

Sadly, I have just been advised that a yacht en route to Australia is using the ZS5MD call sign illegally.

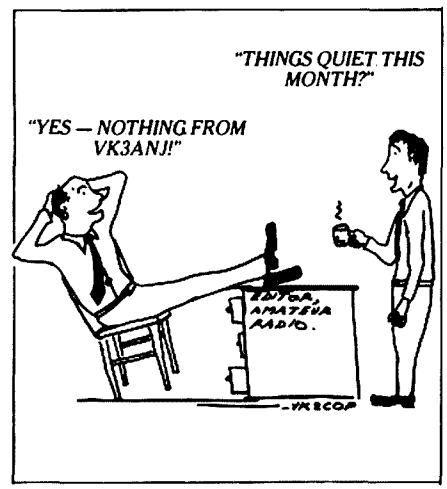
I wish to advise my fellow amateurs, QSL managers and DX columnists of this disappointing event.

Your fraternally,

Charles Bean VK2AOY/ZS5MD,
21/180 Spit Road,
Mosman, NSW. 2088.
AR

SLIGHTLY VOCAL?

It was felt that this cartoon may bring some smiles to the faces of those who have noted, from time-to-time, the articles/letters/comments contributed by Lindsay VK3ANJ.



Lindsay has seen a copy of the cartoon and appreciates its sentiments!

R N Torrington,
4 Thistle Street,
South Pascoe Vale, Vic. 3044.
AR

DISCUSSION PAPER VIEWS

It is no news to many of us that amateur radio is in dire straights. Our fine hobby has become less than it can and should be and consequently attracted fewer and fewer new people to its ranks.

It is for this reason that I was overjoyed to see a discussion paper entitled *Amateur Radio — Future Direction* produced and circulated by Jim Linton VK3PC and Roger Harrison VK2ZTB. These gentlemen have examined the problem in remarkable depth and with great breadth of vision.

Furthermore, they have proposed solutions which are not only appropriate, but based on good old fashioned common sense.

Amateur radio grew up at the start of this century. As the decades ticked by it came to maturity and is now becoming prematurely old. This concerns me. I hope it concerns you. People such as Jim and Roger deserve all the encouragement that we can give them.

Let us not kid ourselves. Amateur radio is not all that it has been. Now it is all black box rigs, gibberings on repeaters and precious little tinkering technology or plain old experimentation.

In the early days people manufactured their own capacitors and most of their other parts. There are many wonderful stories about hand grinding quartz crystals and similar feats.

The World Wars brought more advancement In the technology. Many improvements were made in components, techniques and knowledge.

After the Second World War, there were many rigs available and large stockpiles of other gear. Not much of it was directly suitable for amateur radio. This was the great period of experimentation for the radio amateurs of the world. Rigs were put together out of cheap surplus gear and then modified almost beyond recognition. New techniques were invented and others refined.

The 70s saw the advent of black box rigs and a steady decline in the experimental nature of amateur radio. There was little experimentation or excitement and young, enthusiastic experimenters went elsewhere.

The years up to the 60s are gone, never to return. It is now time to prepare for the 90s.

The thing we need more than anything else is young blood. Are you aware that only nine percent of licensed amateurs are under 31? That only a further 38 percent are between 31 and 50? Over half our ranks are people more than 51 years of age. The brutal fact is that we are all here for only so long. If things continue as they have been for just a couple more decades, amateur radio will be decimated.

No ifs, no buts. What we do today cures amateur radio or kills it forever.

People find their way into amateur radio as they do elsewhere in life. As they pass by, they look into some of the open doors; if those doors are closed they cannot enter.

An example. Many people became interested in CB radio in its early days and came into amateur radio through this door. When the novice licence was introduced the door opened wider and more came through.

Now the door is digital. Many of those who would have been bitten by the *amateur radio bug* became computer hobbyists. Small computers are rather like trains sets. They awaken a powerful curiosity in us all, but the fascination inevitably wears off.

In the late 70s, the micro-computer arrived and some (such as myself) abandoned amateur radio for new fields of experimentation — building micros. In the 80s, black boxes dominated hobbyist computing and the challenge went out of it.

Packet radio and other technologies changes that. The challenges lost to computing have moved back to amateur radio.

Many in the hobbyist micro-computer community would dearly like to get into amateur radio and explore digital technologies further. Talking to them brings out one common theme: they had a look at amateur radio and liked what they saw. Then they looked at the licensing requirements and saw that there just was not a way in for them.

What they can do with computers proves their technical competence, but their talents are digital — not analogue. To try to make them enter amateur radio through a door which is entirely analogue has not worked, and will not work.

Amateur radio has FAX, Computer RTTY, AMTOR, ATV, Satellite Communications and Packet Radio. Powerful incentives for computer hobbyists to join our ranks. They are not doing it because the door is closed. There is no appropriate entry level digital licence for them to enter by.

Jim and Roger have examined these questions and more in their paper. They have included facts, figures, diagrams and logic which cannot be faulted. More than that, they have proposed solutions. Real solutions to real problems. Please read it. Please help.

David Furst VK3YDF,
AR

DISCUSSION PAPER

In regard to the Discussion Paper, February AR, as the paper is directed mainly at the younger generation it may be timely to give a *young point of view*

There has been little interest in amateur radio from the younger generation, and on top of that, a decline in the amateur fraternity.

From a 1984 WIA survey

AGE	PERCENTAGE
Below 21	*1*
21-40	*28*
40-60	*41*
60 plus	*29*
50 plus	*52*
Below 30	*9*

This survey of amateurs is completely contradictory to a population survey by the Australian Bureau of Statistics.

50 plus	*approx 25*
Below 30	*50*

I have been an amateur for over 18 months and have come across few young amateurs. I know of three others my age, (15 years). I attempted starting an amateur radio club at school, but it quickly lapsed due to lack of interest. Their interests in amateur radio are large, but they are not capable of obtaining a license, as some are not too bright scholastically.

I believe, by increasing the number of licences available the hobby's attractiveness will also be increased, particularly by the younger generation.

I look forward to talking to many new amateurs on the air, and I thoroughly support the proposals brought forward in the Discussion Paper.

Adrian Amato VK1NYA,
13 Fullagar Crescent,
Higgins, ACT. 2615.
AR

DISCUSSION PAPER

I am in favour of most of the proposals in the discussion paper, February AR. The introduction of more entry points into the hobby, particularly those catering for the computer generation, would play an important part in getting more people into the amateur ranks.

About the only thing in the paper to which I have any objection, is the suggested increase in power limits for AOCP and LAOCP licence holders. This matter has been well-argued before, so I will not say any more.

The extra licence classes would allow many people to expand their current interest in data communications into the amateur bands. I, personally would appreciate digital privileges as I have been a "hacker" for more years than I have been interested in amateur radio.

However, we need to do more than just making more entry points. What good would these entry points be if no one, except those already interested in reading amateur books/magazines, were to see It?

I think some advertising would need to be done, both now and if/when the new licences were put into operation. The promotion would need to be explanatory and say what the hobby is, how to get a licence, and all the things you can do with the various licences. To cover all of this, I think considerably more is required than an advertisement in a few electronic magazines. The target audience must cover more than just people with an interest in electronics and radio. Perhaps the best was to achieve this would be to have a decent sized article, explaining all the points above, in several daily newspapers through-out Australia, and some major regional ones, as well, with a view to achieving maximum coverage. A television article would also be advantageous.

Another important area to cover is to give talks/demonstrations at schools and colleges, an excellent way of reaching the young people.

Perhaps, while discussing demonstration stations, it would be important to emphasise "cheap equipment". In every demonstration station there must be an operating piece of CHEAP equipment. Many people, especially the younger generation, find it difficult to be able to afford cheap used equipment (about $300). There are few, if any, kits available for less than this price, and many newcomers would not feel confident enough to build them, anyway. A cheap ready-built, novice-suitable transceiver, for 80, 15 and/or 10 metres, is required, preferably for under $150.

Another matter of importance is the role of clubs and individuals. There needs to be a local place where prospective, or just plain curious, people know they can obtain information. In this respect, demonstration stations in public places need the name of the local club prominently displayed to invoke interest. They must also have an adequate supply of pamphlets containing the information, as set out above for media stories.

If the proposed licence grades are introduced, it would also be a good idea to produce articles for the many computer and electronics magazines to show what can be done on amateur radio, with an emphasis on the computing side. I shall put one such article in a small publication of a local club (Geelong) in the near future. I will ask for comments from the readers and try to determine what would make amateur radio more appealing to them. I will inform this column of any results that come from it.

Due to the difficulty in determining who is going to be interested in amateur radio we have to aim our advertising at the general populace on a much larger scale than anything that is currently being attempted — we need to let people know that we exist.

Many of the above suggestions are based on my experience with amateur radio, and what I found, and still find, lacking in the general literature I see. (See page 60, February AR for how Conrad became interested in amateur radio). I was introduced to amateur radio by a cousin and was totally unaware of the existence of amateur radio, let alone the various grades of licence and different modes (you are really allowed to transmit television?), and so on. It was quite an eye opener and I had not led a sheltered life, either. I have been interested in computers and electronics for many years, and read many books of varying types. Amateur radio had not been brought to my attention.

I would gladly offer my assistance to any project that will try to achieve bringing amateur radio to the general populace and to remember the money restrictions of the younger generation. Now that I am on-air, I would gladly pleased to meet with others with similar ideas. (I did finally get on-air much to the detriment of my bank balance, which now reads in three-figures — two being to the right of the decimal point!

Cheers and 73.

Conrad Canterford VK3PHW,
26 Pyke Street,
Tatura, Vic. 3616.
AR

DISCUSSION PAPER

I have studied the Discussion Paper by Messrs Linton and Harrison, and whilst finding it *thought provoking* and interesting, consider some of the suggestions advanced to be detrimental to the Amateur Radio Service in the long term.

One cannot deny the advance of technology, especially in the digital or transmission fields, but this same advance in technology would appear to merit raising the standard of technical qualifi-

cations required for the privilege of using the amateur bands. The Linton and Harrison document advocates the reverse.

The Discussion Paper refers to the downturn in amateur radio, and seeks to ensure *its long term survival.* It claims a level of involvement of young people, and supports this with percentage figures. But, it makes no mention of corresponding figures for these groups in preceding decades of the hobby.

Messrs Linton and Harrison advocate a *Telephony License* for beginners, at a lower technical standard, with VHF/UHF privileges. This seems a retrograde step, as persons who cannot, or do not wish to qualify for amateur status at the current technical level (which is not particularly high), can use both HF and UHF bands allocated to the Citizens Band Service.

We must acknowledge the advances being made in digital technology, and the fact that in some areas they are closely allied to techniques of radio transmission; but *the hobby needs to be made meaningful for a whole new untapped generation of computer hobbyists* and *the emerging computer technology should be married to amateur radio for the fullest possible benefit of the hobby* would appear to be unqualified.

I seriously wonder who would gain the most benefit of this *marriage* on the scale proposed by Messrs Linton and Harrison — the amateur radio movement or the computer hobbyists?

Certainly there are many computer hobbyists who would be a great asset to amateur radio, and who could contribute much, both new technology, and stimulus to our hobby; however there are many so called *computer hobbyists* who by their very lack of technical qualifications and immaturity could prove to be of great nuisance-value if allowed on the amateur bands.

One should not expect to induce into the amateur radio service the type of computer hobbyist we want, by a lowering of the license technical standard.

A modification of the current novice license, still maintaining the technical and code standard, to allow digital transmission modes would appear to have merit, but only if those modes were confined to a specified portion of the band. This allocation should be stipulated by DOC and not by a so-called *Gentlemans' Agreement.*

Amateur radio has many aspects of endeavour which appeal to widely differing groups who use the spectrum. No group should be denied part of that spectrum, simply because they choose to use a different mode of transmission (provided they cause no interference with others).

The transmission of digital encoded data can produce several significant problems of which most amateurs are aware. The hobby is, to a large degree, *self-regulating* and operators using telephony and CW, have over the years, managed to exist fairly well together — because they can converse with one another despite the different modes of transmission.

I admit I am slightly biased in outlook regarding the use of the amateur bands, and as an HF DX operator I am primarily concerned with some of the problems which can arise from unrestricted use of data transmission on HF

For example — if I am enjoying a contact with a fellow amateur and another station commences transmission on phone or CW close to my operating frequency, I can politely ask him to QSY, and if he is a true amateur in spirit he will apologise for the interference and seek another frequency. Should the offending transmission be in a digital mode, the operator will not even hear my request. This situation can lead to a lot of unpleasantry and conduct which is not becoming to our hobby.

I urge all my fellow amateurs to seriously consider the Discussion Paper by Messrs Linton and Harrison, and whilst we should agree to embrace new technology and advances, and make our hobby attractive to the new generation of prospective amateurs, we must exercise caution and prudence.

We must not allow our technical standard to be lowered — if anything it should be raised! We should not indiscriminately advocate any mode of transmission, which in the long term, could prove to be detrimental to the goodwill and friendship built by many amateurs throughout the world in years gone by.

This goodwill and friendship can be maintained by tolerance, acceptance of advancing technology, and unfortunately, by some degree of firm regulation, and maintenance of a high technical standard in the hobby.

Co-author of the Discussion Paper, Jim Linton, indicated that the thoughts and recommendations contained therein were his and Roger Harrison's private views, and not necessarily those of the VK3 Division Council, even though at this time he is the current President of the Division. Similarly, the opinions expressed in this letter are my own, and in no way reflect the collective views of the VK3 Division Council, of which I am a member.

In fact, at the time of writing, the *Discussion Paper* has not yet been tabled or considered by Council.

Barry Wilton VK3XV,
Box 22,
Balaclava, Vic. 3183.
AR

THE MEXICAN EARTHQUAKE FROM THE OTHER SIDE

The 19th September 1985, began like any other day, but at 7.19am Mexicans were reminded just how insecure and uncertain life can be. Mexico was shaken by an 8.1 earthquake, and another, measured at 7.5 on the Richter scale, was experienced on 20th September. Unofficial reports in Mexico indicated that 8 000 died, 30 000 were injured and 100 000 were left homeless.

Maria XE1CVY, had not used her amateur radio equipment for over a year due to license renewal problems, but during the crisis of the earthquake she was given permission to run health and welfare traffic. Dozens of amateur operators responded to her calls and assisted in passing hundreds of messages to anxious families and friends in many parts of the world.

Maria operated for 12-14 hours a day for over a month, only stopping long enough to catch a bite to eat. Maria was ably supported by her husband Mack, and her neighbours.

From material supplied by Maria Jones XE1CVY and contributed by Freda Leaver VK2SU.

Maria and her husband Mack teach at the Baptist Theological Seminary of Mexico and Maria has also had the call signs KA5CVY and CX5BJ. Maria, originally from Mississippi, is multi-lingual and was a participant in a regional Music Conference in Costa Rica in January 1986, where she presented a paper and took voice and singing classes for six hours.

THOUGHT FOR THE MONTH . . .

You can tell when you are on the right road — it's uphill.

GO BACK TO HOME BREW

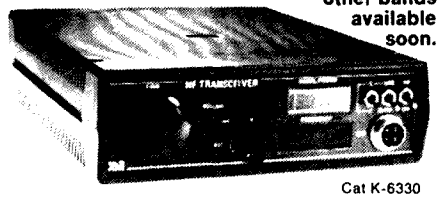
It's the affordable amateur radio!

With the dollar so weak against overseas currencies, imported amateur products are out of many amateurs' reach. Consider the benefits of home brew:

- You supply the labour - so you save!
- You sharpen up those old skills: soldering, construction, etc.
- You catch up with the latest technology: otherwise you could get left behind!
- And best of all, you're keeping alive one of the basic reasons for being an amateur in the first place: you have the skill to do it yourself!

HF TRX KIT

80m version supplied — other bands available soon.

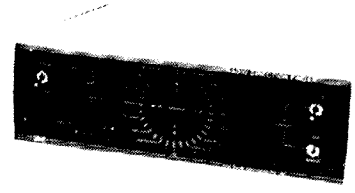


Cat K-6330

Ideal for the novice — or the old timer. 12V operated, so it's a great mobile too. Any 500kHz band between 3 and 30MHz 30 watts SSB output and CW or SSB operation. Digital frequency display, complete kit including deluxe moulded case.

$349

DIGITAL RDF KIT



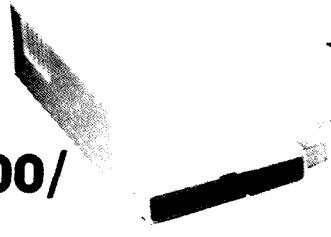
Here's a great new kit to build — and it will give you a real edge in fox hunts, field days, etc. Uses digital techniques to plot and display direction of any signal. Use in conjunction with virtually any FM receiver (or transceiver). Operates over 50 to 500MHz range (with suitable receiver).

Cat K-6345

Ideal for locating 'jammed' transmitters!

$139

Try these latest kits from DSE:



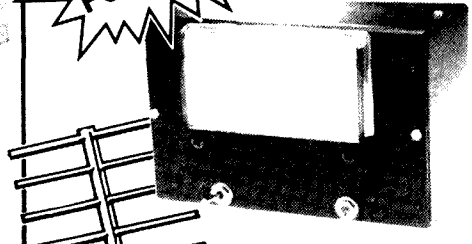
VZ-200/ 300 RTTY DECODER

The low cost way to go RTTY. Use your VZ-200 or VZ-300, add this decoder, and you're ready for RTTY decoding. Simply plugs into computer's expansion port. Suitable for both amateur and commercial standards.

Cat K-6318

$69.50

DSE NO 1 FOR KITS



UHF WATTMETER

Operate on 70? Here's a low-cost way to check out your system. No more guesswork — the UHF Wattmeter tells you instantly power output plus allows SWR extrapolation. At this price, you can't go wrong!

Cat K-6312

$49.95

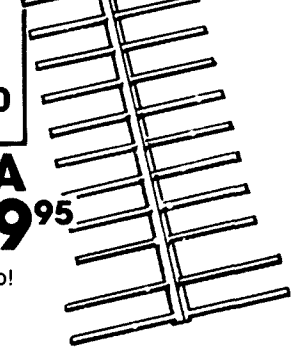
UHF YAGI ANTENNA

At last a kit to build a commercial quality Yagi. Everything's supplied – boom, brackets, elements, the lot. 13 elements, 12.5dBi gain. Go on - give it a go!

$39.95

Cat K-6305

RG-213 Low-loss Co-ax to suit: Cat W-2099 $2.75 per metre.



Want to save even more? Ask your local DSE store for a copy of our 'PRO Series' Bonus Kit Catalogue. It's free - and you could save $$$ on the kits you build! (Also available to mail order customers through DSXpress).

B 123AC

DICK SMITH ELECTRONICS

PTY LTD

• NSW • Albury *21 8399* • Bankstown Square *707 4888* • Blacktown *671 7722* • Blakehurst *546 7744* • Bondi Junction *387 1444* • Brookvale *93 0441* • Campbelltown *27 2199* • Chatswood Chase *411 1955* • Chullora *642 8922* • Gore Hill *439 5311* • Gosford *25 0235* • Hornsby *477 6633* • Liverpool *600 9888* • Maitland *33 7866* • Newcastle 02 61 1896 • North Ryde *88 3855* • Parramatta *689 2188* • Penrith *32 3400* • Railway Square *211 3777* • Sydney City *267 9111* • Tamworth *66 1961* • Wollongong *28 3800* • ACT • Fyshwick *80 4944* • VIC • Ballarat *31 5433* • Bendigo *43 0388* • Box Hill *890 0699* • East Brighton *592 2366* • Coburg *383 4455* • Essendon *379 7444* • Frankston *783 9144* • Geelong *43 8522* • Melbourne City *67 9834* • Richmond *428 1614* • Springvale *547 0522* • QLD • Brisbane City *229 9377* • Buranda *391 6233* • Chermside *359 6255* • Rockhampton *27 9644* • Southport *32 9863* • Toowoomba *38 4300* • Townsville *72 5722* • SA • Adelaide City *212 1962* • Darlington *298 8977* • Enfield *260 6088* • Salisbury *281 1593* • WA • Cannington *451 8666* • Fremantle *335 9733* • North Perth *328 6944* • Perth City *321 4357* • TAS • Hobart *31 0800* • NT • Stuart Park *81 1977*

Silent Keys

It is with deep regret we record the passing of —

MR JACK M COULTER VK5JK
26th January 1986
MR J R DUNNE VK3AXQ
MR R G EDMEADES L50122
29th January 1986
MR K G LILLYCRAP L31057
MR WILLIAM PETER (BILL) NELSON VK2KH
14th January 1986
MR COLIN WILLIAM MCCAMLEY VK4CY
9th January 1986
MR HORRIE OAKES VK2FA
5th January 1986
MR CHARLES ROBERT WHITE VK3AUP
22nd February 1986
MR R J WOOD VK4YZ
3rd November 1985

Obituaries

JACK COULTER VK5JK

Jack, who was the Divisional Historian for the state branch of the WIA, passed away on Sunday, 26th January 1986, at the Repatriation Hospital, Adelaide, aged 73.

He was one of the Old Timers and a WIA Council member of this branch after WWII. Jack was first employed by the PMG, and obtained his original license, VK5JD, in 1936.

When war was declared in late 1939, Jack enlisted in the Royal Australian Navy, and was soon a leading telegraphist, seeing overseas service in the Middle East area, as well as service in New Guinea and Australian coastal waters.

After the war, Jack became a communications officer for the Department of Civil Aviation, where the undersigned first met him at Darwin, in early 1947, when the Aeradio station, VZDN, was being constructed.

Later, in the 1950s, Jack went to work as a technician for *Farmer's Radio,* but shore life was dull, and Jack went back to sea as a radio officer in the Merchant Service, using his Second Class Certificate instead of "letting it rot in the desk drawer".

Jack married in 1942, and his wife Jean was a lovely person whose quietness was a contrast to Jack's enthusiasm. Jean died in 1969, and there are two surviving sons, Dennis and Robert.

After some years at sea as a radio officer in the oil-tankers of H C Sleigh, Jack came ashore in the middle 70s, to retire from wandering, and settle down at last.

His health began to fail him about four years ago and during his remaining years he was Divisional Historian in South Australia. His terminal illness prevented him from giving his full weight to this position, but Jack was awarded a Service Medallion from the WIA for his long service to the organisation as a council member over many years.

There are many people, particularly in the WIA and radio circles, who were helped by Jack over the years and he will be missed by many.

Ray Bennett VK5RM
AR

WILLIAM PETER NELSON VK2KH

Bill Nelson VK2KH, passed away on 14th January 1986, after a long illness. He was first licensed in 1935, and was a member of the Zero Beat Radio Club and a keen CW operator.

In recent years, he enjoyed DX contacts on SSB and CW, and was also well-known on the two metre band.

Bill was active until shortly before he entered hospital.

Jim Webster VK2BZD
AR

COLIN WILLIAM MCCAMLEY VK4CY

It is with the deepest regret that we report the passing of Col McCamley on 9th January 1986, in the Nambour General Hospital (surgical) at the age of 54 years.

Born at Yeppoon, Queensland, Col spent his early years farming in the Gympie, Sarina and Nambour areas, but it was in the building trade that he spent most of his working life, controlling many major construction projects on the Sunshine Coast.

Col was a devoted family man. After an earlier misfortune in each of their lives, Col and Ivy married in 1970, and between them moulded their joint families of seven children into one unified, stable family unit.

During his lifetime, Col was actively involved in many activities including the CMF, Boy Scout Movement and the Volunteer Fire Service, but his great love, when time permitted, was amateur radio.

Col received his limited call, VK4ZMC, in January 1965 and, shortly after, upgraded to VK4CY and was active throughout both the HF and VHF bands. He only bought the minimum amount of equipment necessary and, apart from transceivers, preferred to build his own. His antennas, tower, rotator, control panel, ATU, power supplies, test equipment and most other gear were all home-brew.

He will be remembered throughout Queensland for his contribution to amateur radio. He was a State Controller of the WIAQ. He reconstituted the Sunshine Coast Amateur Radio Club in October 1978, and led it through the difficult earlier formative years as president. Col was always present to help and advise, and to work unobtrusively without thought of personal reward for as long as he was able.

In true amateur spirit, Col helped many aspiring amateurs through their studies and quite a few of these are proud to have VK4CY as their first contact recorded in their logs.

Col will be sorely missed by members of the Sunshine Coast ARC, by the amateur fraternity and his many friends, relatives, children, grandchildren and his lovely wife, Ivy.

Roy Hudson VK4ARU on behalf of the Sunshine Coast ARC
AR

Magazine Review

Roy Hartkopf, VK3AOH
34 Toolangi Road, Alphington, Vic 3078

(G) General : (C) Constructional : (P) Practical without detailed constructional information : (T) Theoretical : (N) Of particular interest to the Novice : (X) Computer Program

WORLDRADIO — January 1986. Cel Tel Industry attacks amateur radio (G). DX news. RTTY/AMTOR news. Traffic in Emergencies.
SHORTWAVE MAGAZINE — December 1985. TRF Receivers (P & N). Single Valve Transmitters (N).
AMSAT UK OSCAR NEWS — December 1985. Update news on OSCAR satellites.
73 MAGAZINE — October 1985. 25th Anniversary issue.
RADIO ELECTRONICS — December 1985. What's new in ICs (G). Switching power supplies (P). CD Players (G).
WHAT'S NEW IN ELECTRONICS — December 1985. General Review of new Components, ICs, Test and Measuring Equipment, Cables, etc.

AR

QSP

SOLAR FLARES

Several Solar Flares in the week leading up to 10th February 1986, caused the worst disturbances to the Earth's magnetic field for 25 years, and whilst severely disrupting HF communications, provided the best six metre DX for 20-25 years.

Associated with a region of high activity on the surface of the sun, the disturbances culminated with a large flare on 6th February, which caused disruptions to HF transmissions throughout the world.

The flares are unusual as the have occurred close to the quietest period in the 11-year solar activity cycle.

Contributed by Peter Wolfenden VK3KAU

SOLAR GEOPHYSICAL SUMMARY — DECEMBER 1985

SOLAR ACTIVITY

Solar activity was low throughout the month. Two regions on the visible polar disc during the month contributed to an increase in the 10cm flux value during the middle of the month, however there was no significant flare activity.

10,7cm FLUX

1, 2/12 = 70; 3/12 = 71; 4/12 = 70; 5/12 = 72; 6/12 = 73; 7/12 = 74; 8/12 = 75; 9, 10/12 = 78; 11/12 = 79; 12/12 = 80; 13/12 = 78; 14/12 = 79; 15/12 = 83; 16/12 = 87; 17/12 = 83; 18/12 = 81; 19, 20/12 = 80; 21/12 = 78; 22/12 = 76; 23/12 = 74; 24/12 = 72; 25/12 = 70; 26, 27, 28/12 = 69; 29/12 = 68; 30, 31/12 = 69. Average: 75.0.
SUNSPOT NUMBER 12/85 = 17.2. YEARLY AVERAGE 6/85 = 17.5.

GEOMAGNETIC ACTIVITY

10/12 The geomagnetic field was at active levels between 0700-1520UTC. A=17.

13/12 The field was active with a brief period around 1100UTC at minor storm level. A=28.

18, 19/12 A sudden commencement was observed at 0647UTC on 18th. This was followed by minor storm conditions between 0800 and 1000UTC. The field was again disturbed on 19th, particularly between 0600-1300UTC. There was a large positive bay around 1330UTC and a smaller one at 1850UTC. A=13, 33.

27-31/12 The field became active about 2100UTC on 27th and reached storm level between 0200 and 1400UTC on 28th. After quietening on 29th, the field again reached storm levels on 30th, declining to unsettled conditions after 1800UTC on 31st. A=11, 35, 7, 35, 24.

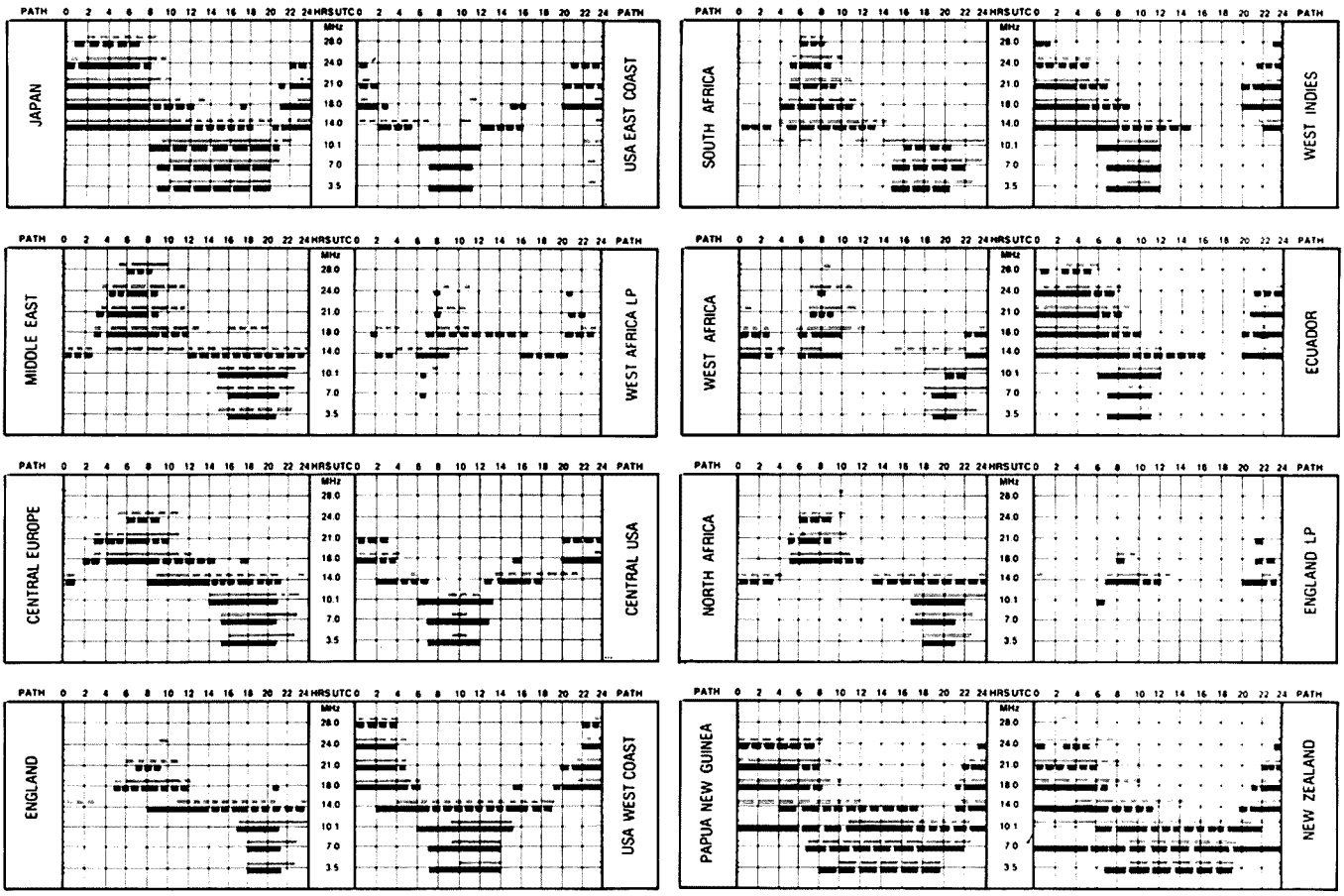
The geomagnetic field reached storm levels on three occasions during the month, but only one was a recurrent (Coronal Hole) type, the other two being the results of filaments erupting from the surface of the sun. There were four days on which the A index exceeded 25 and six days over 15.

Extracted from Solar Geophysical Summary supplied by the Department of Science IPS Radio and Space Services.

AR

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND

From Western Australia (Perth)

From East Australia (Canberra)

Better than 50% of the month but not every day (continuous lines)

Less than 50% of the month (short broken lines)
Mixed Mode Dependent on angle of radiation (long broken lines)

Paths unless otherwise indicated (ie LP = long path) all paths are short path
Predictions reproduced courtesy of the Department of Science and Technology Ionospheric Prediction Service, Sydney
All times in UTC

DEADLINE

All copy for inclusion in the June 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st April 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$2.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

ΞTRADE ADSΞ

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x 220mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Rozelle, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

ΞWANTED — NSWΞ

ATLAS 210X NOISE BLANKER: Model PC-120. Don MacLean VK2DON, QTHR. Ph:(02) 605 1099 anytime.

COMMODORE 64 COMPUTER: In good condition. VK2AZT. Ph:(069) 42 1392.

YAESU FT75 or FT75B VFO UNIT: Any FT75 or 75B equipment. VK2APJ, QTHR. Ph:(047) 59 1651.

ΞWANTED — VICΞ

FRONT COVERS: For SF6 tx/rx, SF6 vibrator supply, gang drive units & coupling cross. Also long bolt through chassis for MN26 sets. Controllers for models H, L, N or M MN26 sets. VK3AQB. Ph:(03)337 4902.

HF LINEAR: FL2001Z or similar. Franz VK3DVD. Ph:(03) 726 7137.

ICOM IC PS-20 POWER SUPPLY: Working order with circuit if possible. Cash for right unit. Ted. Ph:(03) 751 1721.

OCTAL TYPE SOCKET: 9 pin, with or without cover & cable clamp for Collins rx power cable. VK3BFB, QTHR. Ph:(03) 587 1593.

PROP PITCH MOTOR: For spare parts or complete unit. Don VK3DON, QTHR. Ph(03) 848 3059.

ΞWANTED — QLDΞ

PARTS TO COMPLETE WIRELESS STATION A 510: Key (Aust) No1, Antenna flexible 8 ft (Aust), antenna lightweight 68 ft, feeder antenna 70 ohms TSE(W) 8-499, inductors tuning 8ft flexible antenna -520, user handbook 7610-010-0284, crystal units style DE ZAA-0646 (10 off). Please send details to S J Stephens VK4KHQ, QTHR. Also any technical information would be appreciated.

ΞWANTED — SAΞ

MAGAZINE: 73 magazine for November 1972 or copy of article on pages 226 to 244. Ivan VK5QV, QTHR.

ΞWANTED — TASΞ

YAESU YC7B DIGITAL DISPLAY FOR FT7B: Please contact Bill VK7NWR, QTHR. Ph:(002) 44 4089.

ΞFOR SALE — ACTΞ

TS-600 6m TCVR: $315. 70cm power dividers 4-way. $25. 2-way $20. KLM 1:1 sleeve baluns $26 each. VK1VP, QTHR. Ph:(062) 49 6348 AH.

ΞFOR SALE — NSWΞ

COLLINS 51-S1 RX: Plus manual, wing emblem. Collins station control 312B4 & manual, round emblem. Mint cond. Collins linear 30-S1 & manual, round emblem. Mint oond. Runs 4CX1000A Eimac ceramic tube. Ph:(02) 918 3835.

COMMODORE PLUS 4 COMPUTER: Has built-in word processor, spread sheet & file manager. Ideal log book & DX call sign index. Good Cond. $290 ONO or straight swap for Commodore 64 In like cond. VK2AZT. Ph:(069) 42 1392.

HF TCVRs WITH MATCH SUPPLIES & SERVICE MANUALS: 700CX 400W. $350. 100MX 100W all SS mobile/base $425. Both in immac cond. VK2BTL, QTHR. Ph:(02) 487 3383, 359 3434 BH.

HYGAIN 204BA: 4 el monoband 20m Yagi in good cond. $195. Buyer to collect. PMG straight brass key. $65. Firm prices. Ph:(047) 87 7003

LINEAR PARTS: HT power supply t'former 3760-0-3760 CT 750mA 74lbs. New. S-choke filter caps, bleed resistors — Rectifier-Centrifugal fan. Ph:(02) 918 3835.

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SHIMIZU DENSHI SS105s HF TCVR: Incl 100W linear, mic, h'book, leads, etc. Provision for WARC bands. Ideal for mobile use. Used once. $300. Peter VK2AGB. Ph:(02) 521 6482.

TL-922 KENWOOD 2kW LINEAR: In ex cond. Originally $1500, will sell $850 ONO. Also, Multi-7 lots of crystals. $100. Gerald VK2AGS, QTHR. Ph:(02) 93 4170.

TRANSVERTER: 10/11 to 80 metres with built-in VXO. $70 ONO. VK2APJ, QTHR. Ph:(047) 59 1651.

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YAESU FRA-7700 ACTIVE ANTENNA: Unopened, unwanted gift. $68 posted. VK2KSD, QTHR. Ph:(02) 456 1577.

ΞFOR SALE — VICΞ

FILTER CONDENSERS CHANEX 3000 VDCW: 8 only at $5 each. Also, 1 only Yaesu FT-707 at $600 with mic. Bob Cunningham VK3ML, QTHR. Ph:(03) 20 7780.

ICOM 740 WITH FM UNIT: FL-44 N/B SSB filt $750. Icom 730 with FL30 PBT filt, mob mount $600. Both tcvrs in ex cond in orig pack, with mics, manuals. Hustler mob whips, 6 bands with mast bump mount, heavy duty spring $100. Ph:(03) 878 5305.

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ROTATOR EMOTATOR: 502SAX including cables & connections. Ex cond. Also TH3 Jnr tri-band beam & balun. $550 the lot ONO. Icom 735 full coverage tcvr, inc base mic & mounting bracket. Brand new still in box. Great mobile rig, save on new price $1195 ONO. Ph:(051) 99 2393.

SINCLAIR TIMEX 1000: (American version of the ZX 81). 16kB expansion, power supply, user manual, & all leads. Like new $90. VK3DVD. Ph:(03) 726 7137.

TS-820S & MATCH AT-200 ANTENNA TUNER: Mic, book, etc. New tubes, great performer. $550. TH3JR Hygain 3-band, 3- element antenna, on ground. $100. VK3GA, QTHR. Ph:(03) 29 7256.

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ΞFOR SALE — WAΞ

FT-290R: 2m, SSB, CW, FM, Mobile Bracket & carry case. Good cond $320. Wayne VK6AMS. Ph:(097) 55 4106.

YAESU FT-107M: With FP-107, YM-37 mic, Kenwood AT-130 ant tuner. Handbooks & original cartons. All new condition. $900 ONO. John VK6AJC, 12 Beach Street, Bicton, WA. 6157. Ph:(09) 339 2140.

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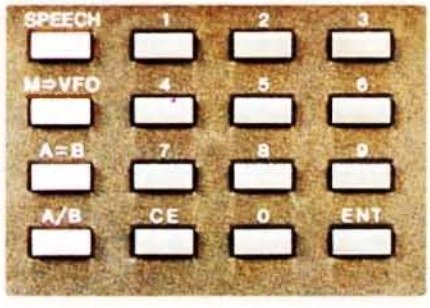

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Amateur Radio

VOL 54, No 5, MAY 1986

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

A BIRD IN THE HAND
a look at the Soviet Woodpecker

1986 NOVICE CONTEST — Rules

USE TWO COMPUTERS FOR CONTEST OPERATION

CW PROGRAMMABLE MEMORY KEYER
to construct

RANDOM MORSE
with a Commodore VIC-20

The Australian Electronics Monthly

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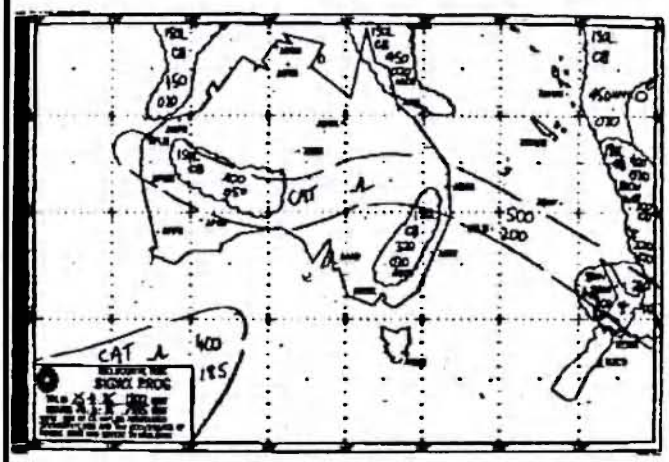
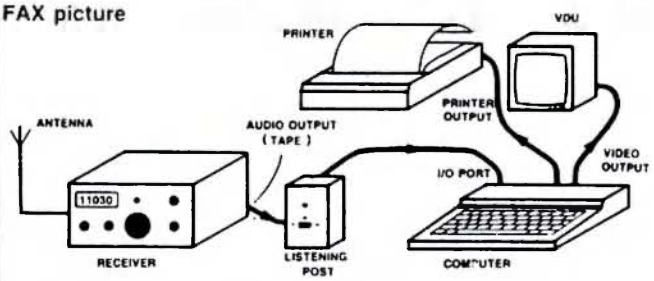


FAX picture



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Amateur Radio

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The main photograph depicts the typical rugged terrain of Pitcairn Island, a choice DX location. (See page 36). Inset: A neat CW Keyer, see page 18 tor constructional details.

Technical Features

Special Features

Regular Features

Florence McKenzie is a name which appears regularly in the ALARA column of this magazine, particularly around ALARA contest time. In the column this month, a NSW OM has taken time to write of his memories, as a young lad, of this pioneering lady. See page 46.

The 21st and 22nd June will see the staging of the 1986 Novice Contest, see page 41 for the rules. Contestants are reminded to read the rules thoroughly and follow them equally as thoroughly. And remember that participation is the key to a successful contest, so join in and share some numerical exchanges.

There are very few active amateurs who have not experienced the *Russian Woodpecker* at sometime during their operating. Amateur Radio has pleasure in bringing readers, what are believed to be the first photographs published outside of the USSR. Bob VK5PU, was invited to take the photographs whilst he was a attending a symposium as a guest of the Soviet Academy of Sciences. (p 4).

This month's magazine has many computer programs for many and varied uses within amateur radio. It is therefore rather topical for a small article from Alan VK4SS, about the first computer — built over 150 years ago. (p 45).

Ever found that when your car, from whence you do all your mobile operating, is off-the-road for any reason, other non-amateur members of the family are reluctant to allow you to cut holes in the roof for antenna installation, etc. George VK3GI, has been in this situation and has solved the problem with a Portable Three-Element Beam for use on two metres, see page 24. This antenna takes less than 10 minutes to erect and has been used many times with outstanding results. (BKP)

NEWS FROM FRANCE

The Reseau des Emetteurs Francais, via F8BO, advises the following change of address for the French OSL Bureau.

Cards should be sent to *REF. QSL, BP 273, F-81209, Mazamet. Cedex.*

Call signs in France are TK; FG; FH; FK; FM; FO; FP; FR; FY and FT. Radio clubs are issued with FF prefixes.

Numerals are designated in licence class — 1 for Class A; 2 for Class B; 3 for Class C; 4 for Class D and 5 for Class E.

Class A licensees may use 144MHz phone and 20 watts; B may use 28.400-29.000MHz and 144MHz phone with 20 watts and 20 watts CW on 7.020-7.040, 14.050-14.100, 21.050-21.150, 28.000-28.100 and 144.050-144.090MHz.

Class C may use 144MHz and 100 watts whilst Class D may use 100 watts CW on all bands, all modes. Class E can use 250 watts, all bands, all modes.

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PO Box 300, Caulfield South, Vic. 3162.
Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162. by the 22nd day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Watch the space below the index for deadline dates. Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgement may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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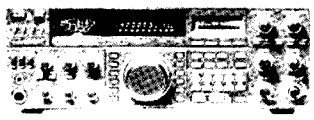

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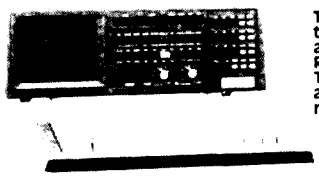

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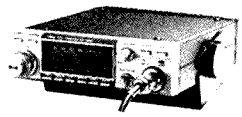

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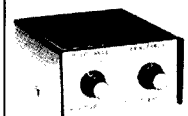

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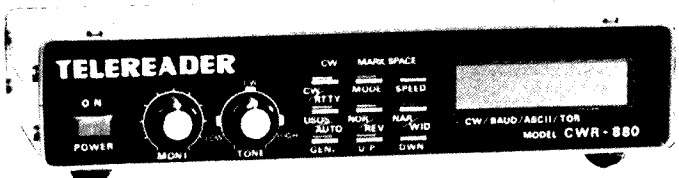

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Active 1919-1939

The name of Doctor V McDowall 4CM, constantly appears in the records of early wireless pioneers in the Sunshine State, firstly around 1907 and continuing through to WWII. In spite of this, much of his work and many of his achievements do not seem to have been officially recorded — or, if they were, the process of time has washed them into oblivion.

Doctor V McDowall was a humane man, highly creative and generous to the point of philanthropy. His somewhat retiring nature and professional ethics kept him from seeking the limelight. Another person of similar talents, with entrepreneural instincts, would have unquestionably been prominent among his peers — instead, Doctor Val preferred to pursue his experiments without any desire for kudos.

He came from one of VK4's outstanding families, his father Mr A McDowall was the Surveyor General of Queensland during the 1880s. After taking his MD in the early 1900s, Val first turned his attention to the X-ray spectrum. He successfully home-brewed an X-ray machine and associated equipment (an outstanding achievement for a young man still in his 20s) and was one of the first of his profession to use radium therapy in VK4.

After WWI, he moved from the country-town of Laidley to Brisbane and set-up a practice at Parbury House, Queen Street, City. Here he met a young man bursting with ambition and ideas, vis Thomas M B Elliott (see Tom's abbreviated biography in AR, November 1985). The ensuing association typifies perfectly the Doctor's generous and supportive nature. Tom was full of schemes and energy, but lacked the financial support needed for his research. Val 4CM, provided him with a very fine place in which to work, assisted with the purchase of equipment and employed him as a radiographer. Without his benefactor's help, it is quite probable that T M B Elliott's name would not be remembered as it is today.

Together they successfully constructed a Broadcast Station using the call sign 4CM, at Preston House, Queen Street, Brisbane. The transmissions were heard throughout eastern Australia and out into the Pacific. To commemorate their achievements, a plaque is now set in the vestibule of this building from whence these *First Sound Broadcasts* in VK4 originated. The claim first has been disputed — but rightly or wrongly — the credit for this feat has gone to these two experimenters.

In 1926, Doctor Val (now married), went to the USA for a six months' holiday with his family. As well as lecturing on the state of the wireless art in Australia, he investigated the progress of television experimentation and kept scheds with Tom Elliott in the hope of creating the first USA/VK4 QSOs. No records can be found to say if this latter was accomplished.

During 1927, Tom Elliott moved Broadcast Station 4CM from Preston House to the Windmill or Observatory Tower on Wickham Terrace, which Val had leased. (It is of passing interest to note here that the man who assisted Tom in making this change of QTH was Harry Angel VK4HA. At 95-years of age, Harry is still working DX on SSB in a clear alert voice. He appears to be Australia's oldest on-air amateur).

A year later, Doctor Val McDowall, now a Specialist Radiologist, joined Tom in experimental work in the Tower, with the object of investigating the possibility of setting up a television station. This joint field of endeavour produced their best work, climaxing in the transmission of the *First Television* pictures in Queensland. These were claimed by some as the best in Australia, with the widest DX coverage — approximately 100 miles (160 km). This was October 1935.

It was inevitable that the success of their work would become known abroad. Because of this, anecdotal sources have it that they were honoured by a visit to the Tower from John Logie Baird, the great English television pioneer. (Date of visit unknown).

In the latter 1930s, the association between Val and Tom appears to have loosened and the Doctor returned to his work in Radiology. At the outbreak of WWII, he joined the Army and was asked to set-up a hospital on the Darling Downs, Queensland. On completion of this task he returned to Brisbane to manage what was virtually three separate medical practices, his own and those of two of his colleagues away on active service. This great work load caused his health to deteriorate and he did little further experimental work in X-ray, television or radio. His call sign 4CM was not renewed after the war.

A letter from his daughter Joan, provides the interesting information that in her view, her father did not receive the print media publicity he rightly deserved. Allegedly, he refused a request by a local newspaper to relinquish his call, for their use, as they wanted a broadcasting outlet.

When time allowed, the Doctor indulged in the following interests: firework making, rowing, boating, big-game fishing, furniture making, photography and flying (licensed pilot at the age of 55-years). His knowledge and research into the display of fireworks was outstanding and caused him to be in demand for many big occasions. While relaxing aboard his elegant yacht *MAKO* he conducted many DX radio experiments.

Doctor Val McDowall became a Silent Key in October 1957 at the age of 76 and he is survived by a son and a daughter.

AR

Editor's Comment

From Our Files

As the May deadline approached (in mid-March) it occurred to your Editor that a search of the published wisdom of past Editors might provide inspiration towards another monthly masterpiece, literary jewel, piece of triviality, or monotonous waste of space (choose your own description as seems appropriate!). The results were interesting.

There have been nine Editors of this magazine since 1941. The first was Tom Hogan VK3HX, (now a Silent Key) who held the reins for an incredible 15 years until 1956. Kel Cocking VK3ZFQ (1960-66) and Bruce Bathols VK3UV (1977-83) each survived the chair for six years, while Ken Pincott VK3AFJ (1966-71) and Bill Roper VK3ARZ (1972-77) each contributed five years of their lives to the cause. Others only lasted for one or two years. But one of the latter was Ron Higginbotham VK3RN (Editor 1958-60), and his two years as Editor do not even suggest how great was his contribution to the magazine. In fact, from 1949 to 1973, Ron was effectively the producer, typesetter and printer of Amateur Radio, even though he retired from the Publication Committee in 1964.

Until that time there had been an *Editor's Award* for the best technical article each year, but with Ron's resignation it was decided to rename it the *Higginbotham Award*. In 1965, its scope was broadened to include *meritorious service towards amateur radio*, and the first recipient was the late (and long lamented) Warwick W (Pansy) Parsons VK5PS. So that is the origin of one of our awards, of which mention was made last month. Over the next few months we hope similarly to dig out the stories of the Technical and Alan Shawsmith Journalistic Awards. The Ron Wilkinson Achievement Award was covered in a separate article last month.

Another interesting fact to emerge was that rarely, before 1983, did an Editor of AR actually write an Editorial! This is not to detract from their contribution to the work of bringing you a magazine each month. In fact, there were numerous periods between 1973 and 1982 when the Editor and others were deeply involved with the *nitty-gritty* of production, now handled with great competence by Betken Productions. For many years the Main QSP effectively the Editorial, was provided by a somewhat faceless *Federal Executive*. But in 1983, Gil Sones VK3AUI, began the custom of a real monthly Editorial, written and signed by the Editor; and your present Editor, much to his joy has now completed another!

Bill Rice VK3ABP
Editor
AR

A Bird in the Hand- . . .

Although a rare bird, there are very few active amateurs world-wide who have not heard of it . . .

Bob Roper VK5PU
Georgia Tech, Atlanta, Georgia, USA. 30332

Even though this is a very rare bird (there are believed to be only three or four extant), there is hardly an amateur alive world-wide who has not heard its call. There are reports of sightings, but these have usually been second-hand, and hard to verify. To the writers knowledge, the photographs of the Russian Woodpecker presented here are the first to be published outside of the Soviet Union. I took them at the Russians' invitation, while attending a symposium in Dushanbe, Tajicistan, as a guest of the Soviet Academy of Sciences.

The *Gorisant* or Horizon Radar located at the Astrophysical Observatory of the Lenin Tajic State University in Dushanbe, Tajicistan (38 degrees north, 69 degrees east) is a research tool used primarily to further knowledge of ionospheric propagation; It obviously has potential for use as an Over The Horizon Radar (OTHR). It is used routinely to observe backscatter at ranges from 2 000 to 4 000 kilometres and beyond.

The most spectacular portions of this system are the transmitting and receiving antennas (see photographs). They are identical, and are spaced several hundred metres apart. On one side of the reflecting screen, which is 75 metres long and 20 metres high, are 16 four element Yagis (driven element plus three directors) on 20 MHz. These are mounted in two bays, eight-over-eight, each bay separately fed, so that they can be phased to vary the beam elevation angle. On the back of tne reflector screen is an array of broadband dipoles, covering from 15 to 30 MHz. Each array is mounted on a circular track, and can be rotated continuously in azimuth.

The Yagi antenna system gain at 20 MHz is in excess of 20dB, and, when driven by a 100kW pulse transmitter produces a signal with an obvious potential for world-wide reception. The broadband dipole array has appreciable gain from 14 to 30 MHz. Echo range versus azimuth is displayed on the plan position indicator CRT which is visible at the bottom left of Figure 2, as is the A scan at the upper left, and the recording camera display (centre).

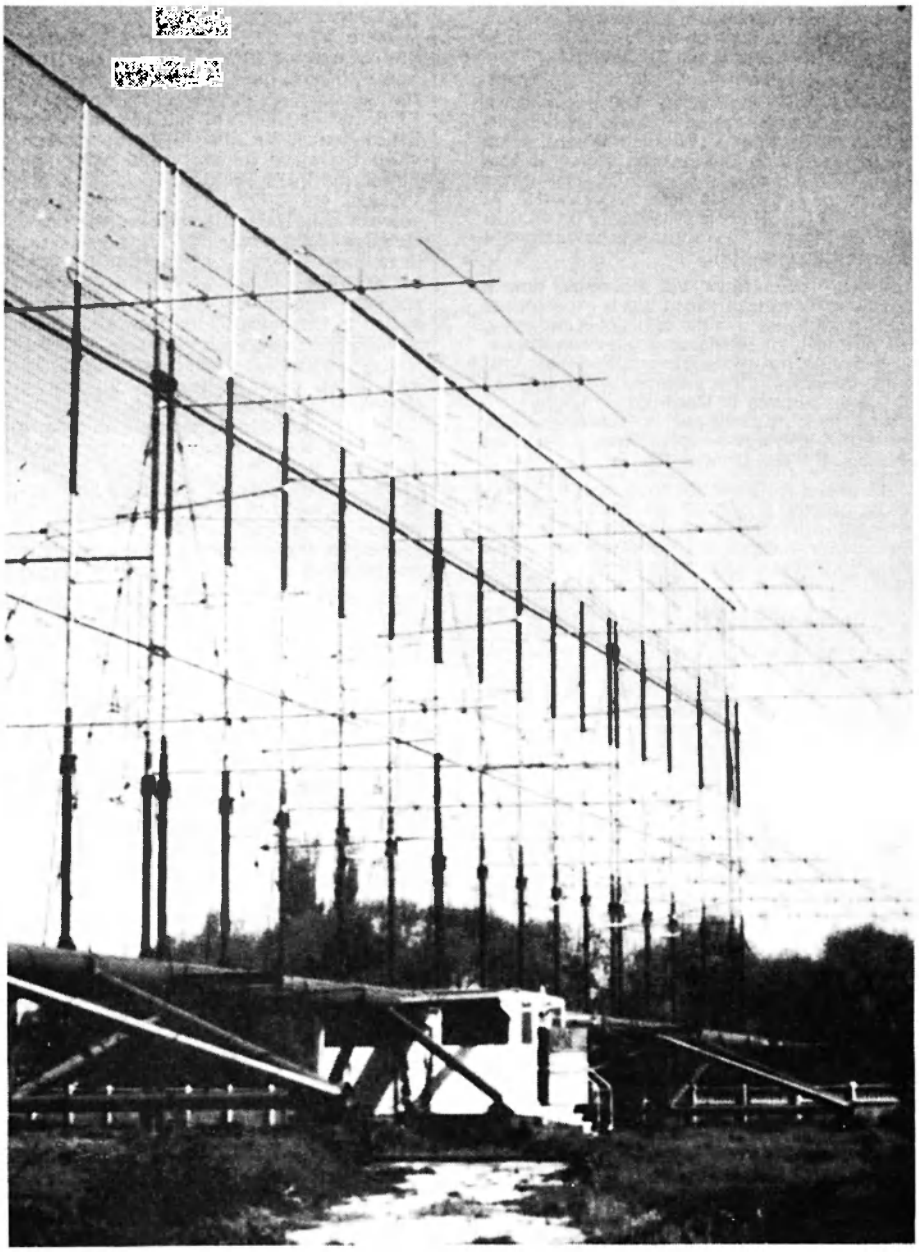
OTHER SYSTEMS

Of course, the Soviet Union is not alone in its interest In, and use of OTHR. An excellent article by O G Villard on experiments in the US was published in QST In April 1980, and one on the HF radar installation near Alice Springs in Australia by Ian Hunt in Amateur Radio for April 1985. These radars do not produce interference In the same manner as the Soviet systems, since they use, among other techniques, spread spectrum to minimise radiation on any given frequency.

In addition to using the Horizon Radar, propagation experiments at the Astrophysical Observatory in Dushanbe are carried out with a conventional ionosonde (Figures 3 and 4), which also has a magnificent antenna system, this time fixed (Figure 5), but which can be phased for oblique sounding. An array of 12 11 element Yagis, steerable in both azimuth and elevation (Figure 6), is used for satellite tracking. Signals from Soviet launched satellites have been used in determining the polar diagrams of the various antenna systems used in their propagation and other experiments.

The above notwithstanding, the Astrophysical Observatory's reputation lies not in the filed of radio propagation, but in the observation of comets and meteors. A large array of telescopic cameras is set up to photograph all of the night sky above an elevation angle of some 20 degrees. These cameras are operated continuously on clear nights, routinely recording meteor trails, and known and possibly new comets and asteroids. Spectrophotometers also record the spectra of the brighter meteors, giving clues as to their chemical composition.

Of more interest to radio amateurs, and VHFers in particular, are the radio meteor



The transmitting antenna of the *GORISONT* or Horizon Radar of the Astrophysical Observatory of the Lenin Tajic State University in Dushanbe, Tajicistan (34 degrees north, 60 degrees east).

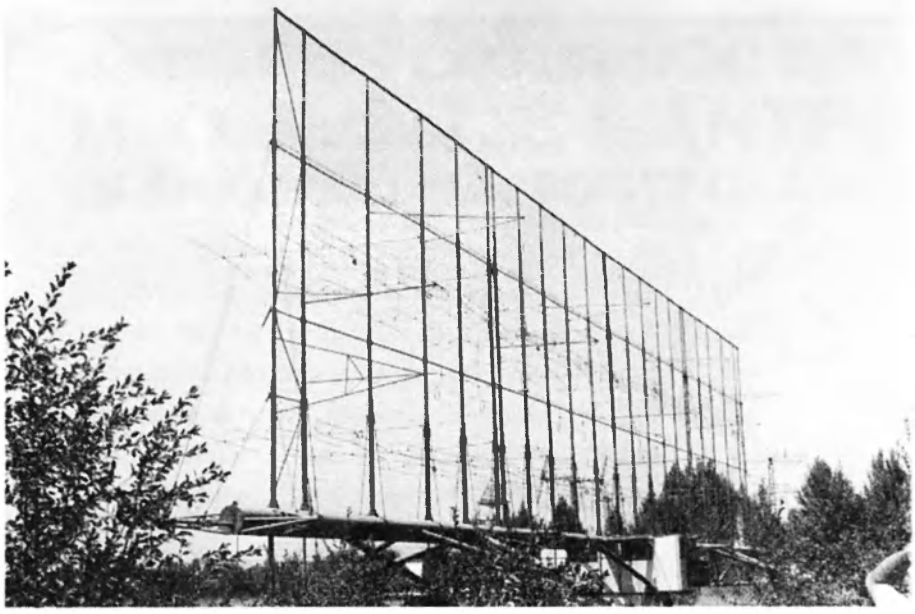


Figure 1 — The back of the transmitting antenna, showing the broadband dipoles.

observations. In addition to determining meteor orbits from a three station recording system, winds in the height range from 80 to 100 kilometres are determined by tracking the ionised trail created by the meteor, as the trail is blown along by the wind. Two antenna arrays at right angles, pointed at an elevation angle of 45 degrees (Figure 7) are used to determine the north-south and east-west wind components as deduced from the line-of-sight drifts of the meteor trails.

While computers are used in data analysis, most of the equipment at the Astrophysical Observatory utilises the technology of the late-50s. This does not detract at all from the successful operation of their systems — it just makes it more labour intensive, and there is no lack of qualified labour available. The fact that they use tubes is no problem, in that the USSR still produces plenty of them; tubes might even be an advantage, since they are not susceptible to EMP!

SYMPOSIUM

The Observatory is a prime contributor to GLOBMET, the Global Meteor Observations Systems of Special Committee on Solar/Terrestrial Physics of the International Council of Scientific Unions, and the occasion of taking these photographs was the first GLOBMET Symposium, held in Dushanbe from 19-24th August 1985, under the auspices of the Soviet Geophysical Committee of the Academy of Sciences of the USSR, the Tajic Academy of Sciences and the Astrophysical Observatory. At this symposium, over 70 presentations were made on subjects ranging from the technical descriptions of meteor radars, to the photographic observations of fireballs, the use of VHF Stratosphere/Troposphere (S/T) wind profilers as meteor radars (VHF S/T radars provide continuous wind profiles throughout the troposphere and into the lower stratosphere by tracking the always present in homogeneities in refractive index of the atmosphere due to atmospheric turbulence, which also provides the mechanism for tropospheric forward scatter) to the detailed analysis and interpretation of mesopause level winds as determined from meteor echo data, and the relationship of meteor streams to cometary orbits, such as the Eta Aquarids and Orionids to Halley's Comet.

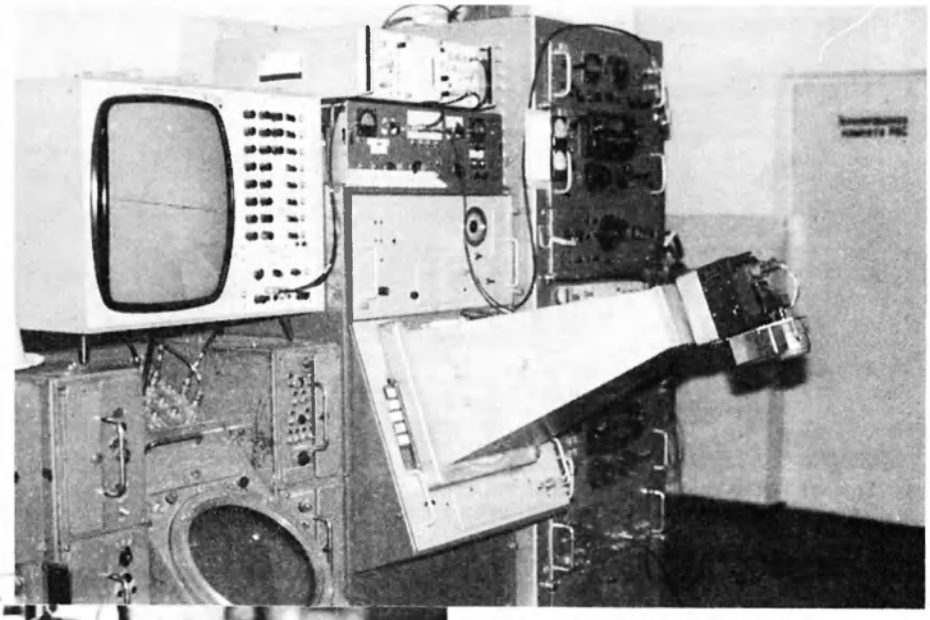


Figure 2 — The receiver/display consols, with a conventional A scan CRT at the upper left, plan position indicator (azimuth and range) below, and the recording camera in the centre.

In addition to scientists from the Soviet Union, representatives of nine other nations were present, including eight from the USA who received travel support from the Atmospheric Research Section of the National Science Foundation. The Symposium was an unqualified success, based in no small measure on the fact that the international community of scientists is imbued with the same spirit of co-operation found in the international amateur radio community; what a pity more of the world's politicians are not scientists and amateur radio enthusiasts!

AR

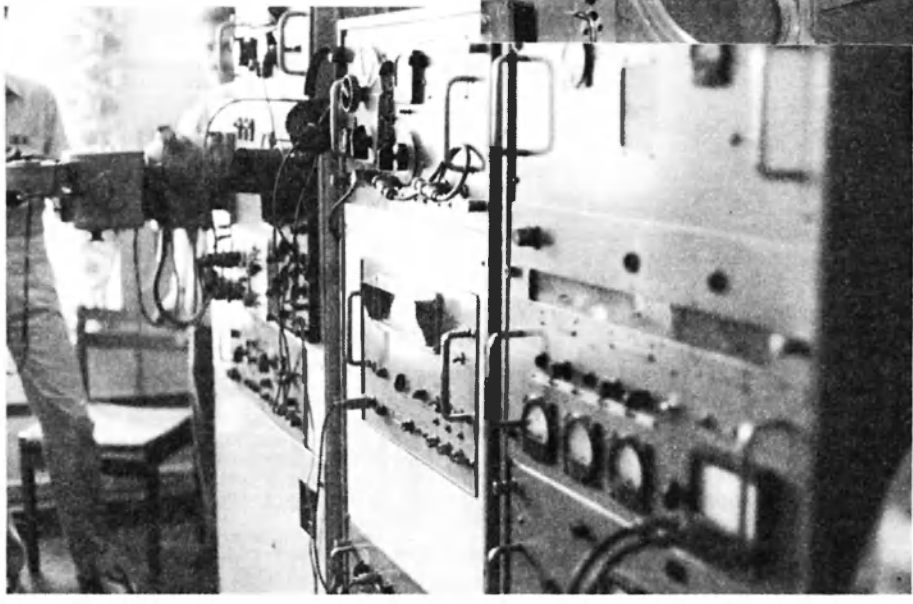


Figure 4 — The ionosonde recording rack.

Please turn the page

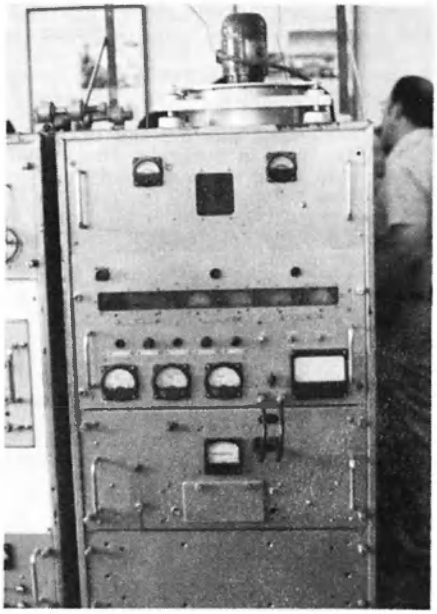


Figure 3 — The ionosonde transmitter.

Figure 5 — The ionosonde antenna.

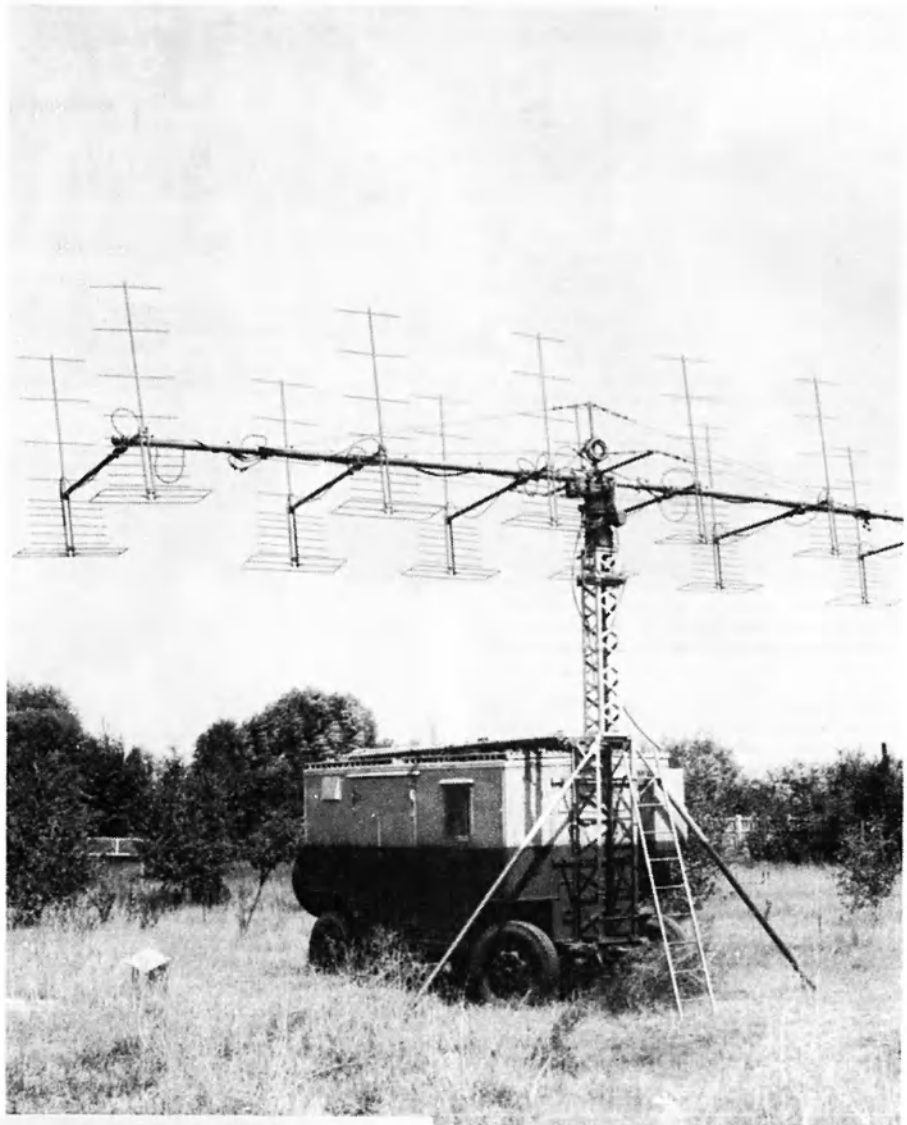


Figure 6 — The satellite tracking antenna and trailer.

Figure 7 — The meteor wind radar antennas.

NEW SATELLITE SERVICE

The Overseas Telecommunications Commission (OTC) is to introduce a new satellite communications service to link computers internationally.

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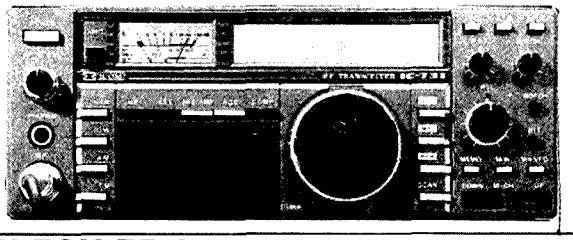

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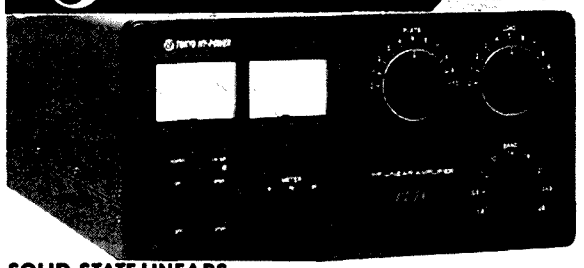

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- HL-35V, 3-30W, GaAsFET $169
- HL-66V, 10-60W, 6m, GaAsFET $269

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- HC-400L w/4pos sw, 160-10m $399
- HC-2000 w/4pos sw, 2 kW ..... POA

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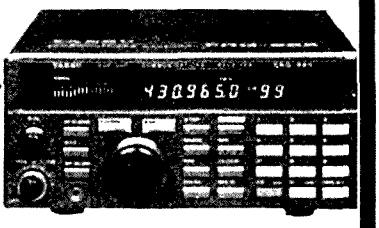

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BASIC ANTENNA AND

Fred Robertson-Mudie VK1MM
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This program is intended as a basic primer for antenna and feedline design, and to act as a handy ready-reference source on antenna and related information.

As can be seen from the menu (lines 220-370), the program covers the more common amateur antennas and, in the case of options A, B, D, E, G, H and I, the program will provide optimum dimensions, feed-point impedance, gain etc for the nominated frequency. Options C and F give further details for the design of Yagis and dipoles respectively. Option J gives dimensions and required capacitance for a Gamma Match at the nominated frequency. Option K allows for the calculation of the impedance of unmarked and unknown coaxial cable (such as the assorted lengths in the corner of your shack). Option L allows for the design, or checking, of open wire feeders to provide particular impedances. Option M gives coaxial cable data for some of the more common types used by amateurs. Option N is a Standard Wire Gauge table and finally, Option O is for frequency to wavelength, and vice-versa, conversion.

All the above material is fairly standard and can be found in a variety of amateur antenna books thus, the program merely acts as an easy way of providing initial designs, dimensions, etc. In addition, if the formulae used in the program are not a particular individuals preferred ones, they can be simply changed.

The program is written for the Amstrad CPC464, which uses Locomotive Basic (a variety of Microsoft Basic), it should therefore be easily converted to run on a range of the more popular home computers. If the thought of typing in the program (it is 19k long) is a bit daunting, I will be happy to make copies of it for any WIA members provided I am supplied with a blank tape or disc, a self-addressed suitable package to return it in and, of course, either pre-stamped or with sufficient funds to cover the postage costs.

AR

```
10 REM ************************
20 REM * ANTENNA & FEEDLINE *
30 REM *   DESIGN PRIMER    *
40 REM ************************
50 REM
60 REM de VK1MM
70 REM
80 MODE 0
90 GOSUB 5660
100 PRINT CHR$(254)
110 PEN 2
120 FOR Y=1 TO 20:LOCATE 1,Y:PRINT CHR$(206):LOCATE 20,Y:PRINT CHR$(206):NEXT
130 FOR X=1 TO 20:LOCATE X,1:PRINT CHR$(206):LOCATE X,20:PRINT CHR$(206):NEXT
140 LOCATE 3,7:PEN 1:PRINT"ANTENNA & FEEDER"
150 LOCATE 4,12:PRINT"DESIGN  PRIMER"
160 LOCATE 7,17:PEN 3:PRINT CHR$(164)" VK1MM"
170 FOR T=1 TO 5000:NEXT T
180 PRINT CHR$(255)
190 CLS:PEN 1:MODE 1
200 PRINT TAB(6)"ANTENNA & FEEDER DESIGN PRIMER "
210 PEN 3:PRINT:PRINT TAB(15) CHR$(164) "  VK1MM"
220 LOCATE 10,5:PEN 2:PRINT"A - HF YAGI"
230 LOCATE 10,6:PEN 1:PRINT"B - VHF/UHF YAGI"
240 LOCATE 10,7:PEN 2:PRINT"C - YAGI DESIGN NOTES"
250 LOCATE 10,8:PEN 1:PRINT"D - DIPOLE (CO-AX FEED)"
260 LOCATE 10,9:PEN 2:PRINT"E - DIPOLE (OPEN WIRE FEED)"
270 LOCATE 10,10:PEN 1:PRINT"F - DIPOLE DESIGN NOTES"
280 LOCATE 10,11:PEN 2:PRINT"G - GROUND PLANE"
290 LOCATE 10,12:PEN 1:PRINT"H - DELTA LOOP"
300 LOCATE 10,13:PEN 2:PRINT"I - CUBICAL QUAD"
310 LOCATE 10,14:PEN 1:PRINT"J - GAMMA MATCH"
320 LOCATE 10,15:PEN 2:PRINT"K - COAX IMPEDANCE"
330 LOCATE 10,16:PEN 1:PRINT"L - OPEN WIRE IMPEDANCE"
340 LOCATE 10,17:PEN 2:PRINT"M - COAX CABLE DATA"
350 LOCATE 10,18:PEN 1:PRINT"N - STANDARD WIRE GAUGE"
360 LOCATE 10,19:PEN 2:PRINT"O - FREQUENCY/WAVELENGTH"
370 LOCATE 10,21:PEN 3:PRINT"Z - END PROGRAM"
380 PEN 1
390 SOUND 1,75,10,10
400 LOCATE 12,25:INPUT"Select Option";a$:a$=UPPER$(a$)
410 IF a$="A" THEN 780
420 IF a$="B" THEN 1170
430 IF a$="C" THEN 570
440 IF a$="D" THEN 1590
450 IF a$="E" THEN 1970
460 IF a$="F" THEN 2400
470 IF a$="G" THEN 2570
480 IF a$="H" THEN 2920
490 IF a$="I" THEN 3330
500 IF a$="J" THEN 3730
510 IF a$="K" THEN 4040
520 IF a$="L" THEN 4430
530 IF a$="M" THEN 4770
540 IF a$="N" THEN 5030
550 IF a$="O" THEN 5300
560 IF a$="Z" THEN CALL &0
570 CLS
580 REM

590 REM **********************
600 REM *YAGI DESIGN NOTES *
610 REM **********************

620 REM
630 PRINT TAB(10)"YAGI DESIGN NOTES"
640 LOCATE 2,3:PRINT"1. For decreased element spacing,length     of elements shou
ld be increased -          and vice versa"
650 LOCATE 2,8:PRINT"2. Additional Directors will increase       gain and F/B rat
io,but decrease          bandwidth and beamwidth"
660 LOCATE 2,13:PRINT"3. Wide element spacing gives higher       gain,less criti
cal tuning of element    lengths and higher input re
sistance     of driven element"
670 LOCATE 2,19:PRINT"4. Additional directors should be          reduced in leng
th by about 5% fo        each additional element"
680 PEN 2
690 LOCATE 8,25:PRINT"Press any key to continue"
700 SOUND 1,75,10,10
710 IF INKEY$="" THEN 710
720 GOTO 190
730 REM
740 REM ********************
750 REM * HF YAGI DESIGN *
760 REM ********************
770 REM
780 CLS:PEN 1
790 PRINT TAB(12)"HF YAGI DESIGN"
800 PEN 2:SOUND 1,75,10,10
810 LOCATE 4,10:PRINT"What is the operating frequency"
820 LOCATE 15,12:INPUT "in MHz";F
830 PEN 1
840 IF F>40 THEN 1170
850 S=ROUND(195/F,2):R=ROUND(495/F,2):D=ROUND(472.5/F,2):H=ROUND(450/F,2):L=2*S
860 CLS:PEN 2
870 LOCATE 10,1:PRINT"Director":LOCATE 29,1:PRINT H "Ft"
880 PEN 1
890 FOR x=18 TO 38:LOCATE x,2:PRINT CHR$(210):NEXT
900 FOR i=2 TO 21:PRINT TAB(28)CHR$(149):NEXT
910 FOR x=17 TO 39:LOCATE x,12:PRINT CHR$(154):NEXT
920 FOR x=16 TO 40:LOCATE x,22:PRINT CHR$(208):NEXT
930 PEN 2
940 LOCATE 10,11:PRINT"Driven":LOCATE 29,11:PRINT D "Ft"
950 LOCATE 10,21:PRINT"Reflector":LOCATE 29,21:PRINT R "Ft"
960 PEN 1
970 LOCATE 28,12:PRINT CHR$(159)
980 PEN 3
990 LOCATE 29,6:PRINT"Spacing":LOCATE 29,7:PRINT S "Ft"
1000 LOCATE 30,16:PRINT"Boom":LOCATE 30,17:PRINT L "Ft"
1010 PEN 1
1020 LOCATE 1,1:PRINT"HF YAGI DESIGN":LOCATE 1,2:PRINT"***************"
1030 PEN 3
1040 LOCATE 1,4:PRINT"For";F"MHz"
1050 PEN 2
1060 LOCATE 1,6:PRINT"Dimensions are":LOCATE 1,7:PRINT"optimum for":LOCATE 1,8:P
RINT"max.gain and":LOCATE 1,9:PRINT"max F/B ratio."
1070 LOCATE 1,12:PRINT"Z = 20-35"CHR$(191):LOCATE 1,15:PRINT"F/B ratio":LOCATE 1
,16:PRINT"     = 25dB":LOCATE 1,19:PRINT"Gain = 7.5d
B"
1080 PEN 3:SOUND 1,75,10,10
1090 LOCATE 15,24:INPUT "More Y/N";b$:b$=UPPER$(b$)
1100 IF b$="Y" THEN 700
1110 IF b$="N" THEN 190
1120 REM

1130 REM ************************
1140 REM * VHF/UHF YAGI DESIGN *
1150 REM ************************

1160 REM
1170 CLS:PEN 1
1180 PRINT TAB(12)"VHF/UHF YAGI DESIGN"
1190 PEN 2
1200 LOCATE 5,10:PRINT"What is the operating frequency"
1210 SOUND 1,75,10,10
1220 LOCATE 15,12:INPUT "in MHz":F
1230 IF F>40 THEN 700
1240 S=ROUND(2360/F,2):R=ROUND(5880/F,2):D=ROUND(5600/F,2):H=ROUND(5320/F,2):L=2
*S
1250 CLS
1260 LOCATE 10,1:PRINT"Director":LOCATE 29,1:PRINT H "ins"
1270 PEN 1
1280 FOR x=18 TO 38:LOCATE x,2:PRINT CHR$(210):NEXT x
1290 FOR i=2 TO 21:PRINT TAB(28)CHR$(149):NEXT
1300 FOR x=17 TO 39:LOCATE x,12:PRINT CHR$(154):NEXT
1310 FOR x=16 TO 40:LOCATE x,22:PRINT CHR$(208):NEXT
1320 PEN 2
1330 LOCATE 10,11:PRINT"Driven":LOCATE 29,11:PRINT D "ins"
1340 LOCATE 10,21:PRINT"Reflector":LOCATE 29,21:PRINT R "ins"
1350 PEN 1
1360 LOCATE 28,12:PRINT CHR$(159)
1370 PEN 3
1380 LOCATE 29,6:PRINT"Spacing":LOCATE 29,7:PRINT S "ins"
1390 LOCATE 30,16:PRINT"Boom":LOCATE 30,17:PRINT L "ins"
1400 PEN 1
1410 LOCATE 1,1:PRINT"VHF/UHF YAGI":LOCATE 1,2:PRINT"*************"
1420 PEN 3
1430 LOCATE 1,4:PRINT"For" F "MHz"
1440 PEN 2
1450 LOCATE 1,8:PRINT"Dimensions are":LOCATE 1,9:PRINT"optimum for":LOCATE 1,10:
PRINT"max gain and":LOCATE 1,11:PRINT"max F/B ratio"
1460 LOCATE 1,14:PRINT"Z = 20-35"CHR$(191)
1470 LOCATE 1,16:PRINT"F/B ratio":LOCATE 5,17:PRINT"= 25dB":LOCATE 1,20:PRINT"Ga
in = 7.5dB"
1480 PEN 3
1490 SOUND 1,75,10,10
1500 LOCATE 12,25:INPUT "More Y/N";r$
1510 r$=UPPER$(r$)
1520 IF r$="Y" THEN 1170
1530 IF r$="N" THEN 190
1540 REM

1550 REM ******************************
1560 REM * DIPOLE DESIGN (CO-AX FEED) *
1570 REM ******************************

1580 REM
1590 CLS:PEN 1
1600 PRINT TAB(14)"DIPOLE DESIGN"
1610 PEN 3
1620 LOCATE 14,3:PRINT"(Co-ax Feed)"
1630 PEN 2
1640 LOCATE 5,8:PRINT"What is the operating frequency"
1650 SOUND 1,75,10,10
1660 LOCATE 15,10:INPUT "in MHz":F
1670 PEN 1
1680 L=ROUND(468/F,2):E=L/2
1690 CLS
1700 FOR x=20 TO 28:LOCATE x,9:PRINT CHR$(154):NEXT x
```

FEEDER DESIGN PRIMER

```
1710 LOCATE 29,9:PRINT CHR$(143)
1720 FOR x=30 TO 38:LOCATE x,9:PRINT CHR$(154):NEXT x
1730 PEN 2
1740 LOCATE 24,5:PRINT"Total Length":LOCATE 25,7:PRINT L "Ft"
1750 LOCATE 20,11:PRINT"Length of each leg":LOCATE 25,13:PRINT E "Ft"
1760 PEN 1
1770 LOCATE 1,1:PRINT"DIPOLE DESIGN"
1780 LOCATE 1,2:PRINT"**************"
1790 PEN 3
1800 LOCATE 2,2:PRINT"(Co-ax Feed)"
1810 PEN 2
1820 LOCATE 2,5:PRINT "For" F "MHz"
1830 PEN 1
1840 LOCATE 2,9:PRINT"Z = 60-75"CHR$(191)
1850 LOCATE 2,12:PRINT"Gain = 2.1dBi"
1860 PEN 3
1870 SOUND 1,75,10,10
1880 LOCATE 12,24:INPUT "More Y/N";a$
1890 a$=UPPER$(a$)
1900 IF a$="Y" THEN 1590
1910 IF a$="N" THEN 190
1920 REM
1930 REM ****************************
1940 REM * DIPOLE (OPEN WIRE FEED) *
1950 REM ****************************

1960 REM
1970 CLS:PEN 1
1980 PRINT TAB(12)"DIPOLE DESIGN"
1990 PEN 3
2000 LOCATE 11,3:PRINT"(Open Wire Feed)"
2010 PEN 2
2020 SOUND 1,75,10,10
2030 LOCATE 5,8:PRINT"What is the operating frequency":LOCATE 15,10:INPUT "in MH
z";F
2040 PEN 1
2050 L=ROUND(468/F,2):C=ROUND(118/F,2):E=ROUND(148/F,2)
2060 CLS
2070 FOR x=17 TO 38:LOCATE x,9:PRINT CHR$(210):NEXT x
2080 LOCATE 25,10:PRINT CHR$(205):LOCATE 30,10:PRINT CHR$(204):LOCATE 26,11:PRIN
T CHR$(205):LOCATE 29,11:PRINT CHR$(204)
2090 FOR x=12 TO 17:PRINT TAB(28)CHR$(209):PRINT TAB(27)CHR$(211):NEXT
2100 PEN 2
2110 LOCATE 16,5:PRINT"Element Length" L "Ft"
2120 PEN 3
2130 LOCATE 25,8:PRINT CHR$(1)CHR$(8)CHR$(32)CHR$(67)CHR$(32)CHR$(32)CHR$(1)CHR$
(9)
2140 LOCATE 31,10:PRINT CHR$(1)CHR$(11):LOCATE 31,11:PRINT"E":LOCATE 31,12:PRINT
 CHR$(1)CHR$(10)
2150 LOCATE 15,12:PRINT"C="C"Ft":LOCATE 15,15:PRINT"E="E"Ft"
2160 PEN 2
2170 LOCATE 20,20:PRINT"600"CHR$(191):LOCATE 30,21:PRINT"line,any":LOCATE 30,22:
PRINT"length"
2180 LOCATE 14,19:PRINT"Line spacing":PEN 3:LOCATE 14,21:PRINT"8 in.for 12g":LOC
ATE 14,22:PRINT"6 in.for 14g":LOCATE 14,23:PRINT"5 i
n.for 16g":LOCATE 14,24:PRINT"3"CHR$(170)"in.for 18g"
2190 PEN 1
2200 LOCATE 2,1:PRINT"DIPOLE DESIGN"
2210 LOCATE 2,2:PRINT"**************"
2220 LOCATE 1,7:PRINT"(Open Wire Feed)"
2230 PEN 3
2240 LOCATE 1,5:PRINT"For" F "MHz"
2250 PEN 2
2260 LOCATE 1,8:PRINT "This is the":LOCATE 1,9:PRINT "most efficient":LOCATE 1,1
0:PRINT "method of":LOCATE 1,11:PRINT "feeding a":LO
CATE 1,12:PRINT "dipole with"
2270 LOCATE 1,13:PRINT "an open wire":LOCATE 1,14:PRINT "line.":LOCATE 1,15:PRIN
T"Matching is":LOCATE 1,16:PRINT"via the delta":LOCA
TE 1,17:PRINT"match and ATU"
2280 LOCATE 1,19:PRINT"Gain =":LOCATE 3,20:PRINT"2.15dBi"
2290 PEN 1
2300 SOUND 1,75,10,10
2310 LOCATE 1,25:INPUT "More Y/N";f$
2320 f$=UPPER$(f$)
2330 IF f$="Y" THEN 1970
2340 IF f$="N" THEN 190
2350 REM
2360 REM ************************
2370 REM * DIPOLE DESIGN NOTES *
2380 REM ************************
2390 REM
2400 CLS:PEN 1
2410 PRINT TAB(10)"DIPOLE DESIGN NOTES"
2420 LOCATE 1,3:PRINT"1. Z is approx.= 73"CHR$(191)"   but will vary with height
 above       ground"
2430 LOCATE 1,7:PRINT"2. Length will vary with thickness of       material"
2440 LOCATE 1,10:PRINT"3. K (constant) for material varies from   0.92 for thin
 wire to 0.98 for 1 in.    tubing"
2450 LOCATE 1,14:PRINT"4. For MF dipoles the formula for          calculating le
ngth is L=(492*)/F Ft."
2460 LOCATE 1,17:PRINT"5. For VHF dipoles the formula for         calculating le
ngth is L=(5905*)/F      inches"
2470 SOUND 1,75,10,10
2480 PEN 2
2490 LOCATE 8,25:PRINT"Press any key to continue"
2500 IF INKEY$="" THEN 2500
2510 CLS:GOTO 190
2520 REM
2530 REM ************************
2540 REM * GROUND PLANE DESIGN *
2550 REM ************************

2560 REM
2570 CLS:PEN 1
2580 PRINT TAB(9)"GROUND PLANE DESIGN"
2590 PEN 2
2600 SOUND 1,75,10,10
2610 LOCATE 5,8:PRINT"What is the operating frequency":LOCATE 15,10:INPUT "in MH
z";F
2620 CLS:PEN 1
2630 H=ROUND(236/F,2):R=ROUND(H*1.05,2)
2640 FOR i=2 TO 13:PRINT TAB(30)CHR$(149):NEXT
2650 LOCATE 26,9:PRINT CHR$(205):LOCATE 27,10:PRINT CHR$(205):LOCATE 28,11:PRINT
 CHR$(205):LOCATE 29,12:PRINT CHR$(205)
2660 LOCATE 24,9:PRINT CHR$(204):LOCATE 23,10:PRINT CHR$(204):LOCATE 22,11:PRINT
 CHR$(204):LOCATE 21,12:PRINT CHR$(204)
2670 LOCATE 30,13:PRINT CHR$(203)
2680 LOCATE 29,14:PRINT CHR$(204):LOCATE 28,15:PRINT CHR$(204):LOCATE 27,16:PRIN
T CHR$(204):LOCATE 26,17:PRINT CHR$(204)
2690 LOCATE 21,14:PRINT CHR$(205):LOCATE 22,15:PRINT CHR$(205):LOCATE 23,16:PRIN
T CHR$(205):LOCATE 24,17:PRINT CHR$(205)
2700 PEN 3
2710 LOCATE 20,4:PRINT"Radiator":LOCATE 21,5:PRINT H "Ft"
2720 LOCATE 27,20:PRINT"Radials":LOCATE 28,21:PRINT R "Ft"
2730 PEN 1
2740 LOCATE 1,1:PRINT"GROUND PLANE DESIGN"
2750 LOCATE 1,2:PRINT"********************"
2760 LOCATE 1,4:PRINT"For" F "MHz"
2770 PEN 2
2780 LOCATE 1,7:PRINT"Z = 30-50"CHR$(191)
2790 LOCATE 1,9:PRINT"Z may vary with":LOCATE 1,10:PRINT"diam.of tubing":LOCATE
 1,11:PRINT"and droop angle":LOCATE 1,12:PRINT"of rad
ials, e.g.":LOCATE 1,13:PRINT"30"CHR$(191)" for horz'l.":LOCATE 1,14:PRINT"50"CHR
$(191)" for 45 deg."
2800 LOCATE 1,17:PRINT"Gain = 1.5dBi"
2810 PEN 3
2820 SOUND 1,75,10,10
2830 LOCATE 12,24:INPUT "More Y/N";a$
2840 a$=UPPER$(a$)
2850 IF a$="Y" THEN 2570
2860 IF a$="N" THEN 190
2870 REM

2880 REM **********************
2890 REM * DELTA LOOP DESIGN *
2900 REM **********************

2910 REM
2920 CLS:PEN 1
2930 PRINT TAB(12)"DELTA LOOP DESIGN"
2940 PEN 2
2950 SOUND 1,75,10,10
2960 LOCATE 5,8:PRINT"What is the operating frequency":LOCATE 15,10:INPUT "in MH
z";F
2970 CLS:PEN 1
2980 R=ROUND(1030/F,2):D=ROUND(1005/F,2):S=ROUND(0.2*984/F),2)
2990 FOR x=16 TO 23:LOCATE x,7:PRINT CHR$(210):NEXT x
3000 FOR x=28 TO 35:LOCATE x,7:PRINT CHR$(210):NEXT x
3010 FOR x=20 TO 31:LOCATE x,12:PRINT CHR$(200):NEXT x
3020 LOCATE 16,8:PRINT CHR$(205):LOCATE 17,9:PRINT CHR$(205):LOCATE 18,10:PRINT
CHR$(205):LOCATE 19,11:PRINT CHR$(205)
3030 LOCATE 23,8:PRINT CHR$(204):LOCATE 22,9:PRINT CHR$(204):LOCATE 21,10:PRINT
CHR$(204):LOCATE 20,11:PRINT CHR$(204)
3040 LOCATE 28,8:PRINT CHR$(205):LOCATE 29,9:PRINT CHR$(205):LOCATE 30,10:PRINT
CHR$(205):LOCATE 31,11:PRINT CHR$(205)
3050 LOCATE 35,8:PRINT CHR$(204):LOCATE 34,9:PRINT CHR$(204):LOCATE 33,10:PRINT
CHR$(204):LOCATE 32,11:PRINT CHR$(204)
3060 PEN 2
3070 LOCATE 16,5:PRINT"Driven":LOCATE 28,5:PRINT"Reflector"
3080 PEN 3
3090 LOCATE 15,6:PRINT D "Ft":LOCATE 28,6:PRINT R "Ft"
3100 PEN 2
3110 LOCATE 28,14:PRINT"Boom"
3120 PEN 3:LOCATE 24,14:PRINT S "Ft"
3130 PEN 1
3140 LOCATE 1,1:PRINT"DELTA LOOP DESIGN"
3150 LOCATE 1,2:PRINT"******************"
3160 LOCATE 1,4:PRINT"For" F "MHz"
3170 PEN 2
3180 LOCATE 1,8:PRINT"Use tubing for":LOCATE 1,9:PRINT"sides and wire":LOCATE 1,
10:PRINT"for tops."
3190 LOCATE 1,13:PRINT"Z = 80-90"CHR$(191)
3200 LOCATE 1,15:PRINT"Gain = 8dB"
3210 LOCATE 1,17:PRINT"F/B ratio = 20dB"
3220 SOUND 1,75,10,10
3230 PEN 3
3240 LOCATE 11,25:INPUT "More Y/N";a$
3250 a$=UPPER$(a$)
3260 IF a$="Y" THEN 2920
3270 IF a$="N" THEN 190
3280 REM

3290 REM ************************
3300 REM * CUBICAL QUAD DESIGN *
3310 REM ************************

3320 REM
3330 CLS:PEN 1
3340 PRINT TAB(10)"CUBICAL QUAD DESIGN"
3350 PEN 2
3360 SOUND 1,75,10,10
3370  LOCATE 5,8:PRINT"What is the operating frequency":LOCATE 15,10:INPUT "in M
Hz";F
3380 CLS:PEN 2
3390 R=ROUND(1032/F,2):D=ROUND(1010/F,2):P=ROUND(980/F,2):S=ROUND(0.2*984/F,2)
3400 FOR x=24 TO 34:LOCATE x,9:PRINT CHR$(208):NEXT
3410 PEN 1
3420 LOCATE 20,8:PRINT CHR$(204):LOCATE 21,7:PRINT CHR$(204):LOCATE 22,6:PRINT C
HR$(204):LOCATE 23,5:PRINT CHR$(204):LOCATE 24,5:PRI
NT CHR$(205):LOCATE 25,6:PRINT CHR$(205):LOCATE 26,7:PRINT CHR$(203):LOCATE 27,8
:PRINT CHR$(205)
3430 LOCATE 25,8:PRINT CHR$(204):LOCATE 27,6:PRINT CHR$(204):LOCATE 28,5:PRINT C
HR$(204):LOCATE 29,5:PRINT CHR$(205):LOCATE 30,6:PRI
NT CHR$(205):LOCATE 31,7:PRINT CHR$(203):LOCATE 32,8:PRINT CHR$(205)
3440 LOCATE 30,8:PRINT CHR$(204):LOCATE 32,6:PRINT CHR$(204):LOCATE 33,5:PRINT C
HR$(204):LOCATE 34,5:PRINT CHR$(205):LOCATE 35,6:PRI
NT CHR$(205):LOCATE 36,7:PRINT CHR$(205):LOCATE 37,8:PRINT CHR$(205)
3450 LOCATE 28,9:PRINT CHR$(205):LOCATE 21,10:PRINT CHR$(205):LOCATE 22,11:PRINT
 CHR$(205):LOCATE 23,12:PRINT CHR$(205):LOCATE 24,12
:PRINT CHR$(204):LOCATE 25,11:PRINT CHR$(204):LOCATE 26,10:PRINT CHR$(203):LOCAT
E 27,9:PRINT CHR$(204)
3460 LOCATE 25,9:PRINT CHR$(205):LOCATE 27,11:PRINT CHR$(205):LOCATE 28,12:PRINT
 CHR$(205):LOCATE 29,12:PRINT CHR$(204):LOCATE 30,11
:PRINT CHR$(204):LOCATE 31,10:PRINT CHR$(203):LOCATE 32,9:PRINT CHR$(204)
3470 LOCATE 30,9:PRINT CHR$(205):LOCATE 32,11:PRINT CHR$(205):LOCATE 33,12:PRINT
 CHR$(205):LOCATE 34,12:PRINT CHR$(204):LOCATE 35,11
:PRINT CHR$(204):LOCATE 36,10:PRINT CHR$(204):LOCATE 37,9:PRINT CHR$(204)
3480 PEN 3
3490 LOCATE 18,4:PRINT"Reflector":LOCATE 27,3:PRINT"Driven":LOCATE 33,4:PRINT"Di
rector"
3500 LOCATE 18,15:PRINT R "Ft":LOCATE 24,14:PRINT D "Ft":LOCATE 38,15:PRINT P "F
t"
3510 PEN 2
3520 LOCATE 22,17:PRINT"Spacing" S "Ft"
3530 PEN 1
3540 LOCATE 1,1:PRINT"CUBICAL QUAD DESIGN"
3550 LOCATE 1,2:PRINT"*******************"
3560 PEN 2
3570 LOCATE 1,4:PRINT"For" F "MHz"
3580 LOCATE 1,8:PRINT"Z = 75"CHR$(191)
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3590 LOCATE 1,11:PRINT"F/D ratio = 55dB"
3600 LOCATE 1,14:PRINT"Gain = 8.5dB"
3610 LOCATE 1,17:PRINT"All directors":LOCATE 1,18:PRINT"are 2.5%":LOCATE 1,19:PR
INT"shorter":LOCATE 1,20:PRINT"than the":LOCATE 1,21
:PRINT"driven el."
3620 PEN 1
3630 SOUND 1,75,10,10
3640 LOCATE 14,25:INPUT "More Y/N";a$
3650 a$=UPPER$(a$)
3660 IF a$="N" THEN 190
3670 IF a$="Y" THEN 3330
3680 REM
3690 REM ************************
3700 REM * GAMMA MATCH DESIGN *
3710 REM ************************
3720 REM
3730 CLS:PEN 1
3740 PRINT TAB(10)"GAMMA MATCH DESIGN"
3750 PEN 2
3760 SOUND 1,75,10,10
3770 LOCATE 5,8:PRINT"What is the operating frequency":LOCATE 15,10:INPUT "in MH
z";F
3780 CLS:PEN 1
3790 C=INT(300/F*6.2):A=ROUND((300/F*39.91*0.055,2):B=ROUND((300/F*39.9)*0.0085,
2)
3800 FOR x=20 TO 30:LOCATE x,10:PRINT CHR$(210):NEXT
3810 FOR i=11 TO 14:PRINT TAB(26) CHR$(149):NEXT
3820 LOCATE 36,14:PRINT CHR$(153)
3830 LOCATE 25,12:PRINT"!!":LOCATE 25,14:PRINT"!!":LOCATE 25,15:PRINT"!!"
3840 FOR x=22 TO 24:LOCATE x,14:PRINT CHR$(154):NEXT:LOCATE 25,14:PRINT CHR$(157
):LOCATE 26,14:PRINT CHR$(151):FOR x=27 TO 35:LOCATE
x,14:PRINT CHR$(154):NEXT
3850 PEN 3
3860 LOCATE 37,11:PRINT CHR$(1)CHR$(11):LOCATE 37,12:PRINT"B":LOCATE 37,14:PRINT
CHR$(1)CHR$(10)
3870 LOCATE 22,16:PRINT"Variable":LOCATE 22,17:PRINT"Capacitor":LOCATE 26,18:PRI
NT"C"
3880 LOCATE 22,12:PRINT CHR$(1)CHR$(8):LOCATE 23,12:PRINT"-----A------":LOCATE 3
5,12:PRINT CHR$(1)CHR$(9)
3890 PEN 1
3900 LOCATE 10,1:PRINT"GAMMA MATCH DESIGN"
3910 LOCATE 10,2:PRINT"*****************"
3920 PEN 2
3930 LOCATE 1,8:PRINT"A = " A "ins.":LOCATE 1,10:PRINT"B = " B "ins.":LOCATE 1,1
2:PRINT"C(max)= " C "pF"
3940 PEN 1:SOUND 1,75,10,10
3950 LOCATE 12,25:INPUT "More Y/N";a$
3960 a$=UPPER$(a$)
3970 IF a$="Y" THEN 3730
3980 IF a$="N" THEN 190
3990 REM
4000 REM ************************
4010 REM * COAX CABLE IMPEDANCE *
4020 REM ************************
4030 REM
4040 CLS:PEN 1
4050 PRINT TAB(10)"COAXIAL CABLE IMPEDANCE"
4060 SOUND 1,75,10,10
4070 LOCATE 9,8:PRINT"Inside Diameter (D) of"
4080 LOCATE 16,9:INPUT"Outer Conductor";D
4090 SOUND 1,75,10,10
4100 LOCATE 9,12:PRINT "Outside Diameter (d) of"
4110 LOCATE 17,13:INPUT "Inner Conductor";d
4120 SOUND 1,75,10,10
4130 LOCATE 9,16:PRINT "Dielectric constant (k)"
4140 LOCATE 12,17:PRINT"1.0 for air"
4150 LOCATE 12,18:PRINT"2.0 Teflon (PTFE)"
4160 LOCATE 12,19:INPUT "2.26 for polythene";k
4170 Z=ROUND((138/SQR(k))*LOG10(D/d),2)
4180 CLS
4190 SOUND 1,75,10,10
4200 FOR a=1 TO 360 STEP 5
4210 DEG
4220 PLOT 300,150
4230 PLOT 300+85*COS(a),150+85*SIN(a)
4240 PLOT 300+20*COS(a),150+20*SIN(a)
4250 NEXT
4260 PRINT TAB(8)"COAXIAL CABLE IMPEDANCE"
4270 PEN 2
4280 LOCATE 10,5:PRINT "Impedance =";Z; CHR$(191)
4290 PEN 3
4300 LOCATE 25,11:PRINT CHR$(200)CHR$(200)CHR$(200):LOCATE 26,12:PRINT CHR$(1)CH
R$(11):LOCATE 26,16:PRINT"D":LOCATE 26,21:PRINT CHR$
(1)CHR$(10):LOCATE 25,22:PRINT CHR$(200)CHR$(200)CHR$(200)
4310 LOCATE 22,14:PRINT"_":LOCATE 22,16:PRINT"d":LOCATE 22,17:PRINT"_"
4320 PEN 1
4330 SOUND 1,75,10,10
4340 LOCATE 15,25: INPUT "More Y/N";a$
4350 a$=UPPER$(a$)
4360 IF a$="Y" THEN 4040
4370 IF a$="N" THEN 190
4380 REM
4390 REM ************************
4400 REM * OPEN WIRE IMPEDANCE *
4410 REM ************************
4420 REM
4430 CLS:PEN 1
4440 PRINT TAB(8)"OPEN WIRE LINE IMPEDANCE"
4450 SOUND 1,75,10,10
4460 LOCATE 5,8:INPUT "Spacing between wires (S)";S
4470 SOUND 1,75,10,10
4480 LOCATE 5,12:INPUT "Diameter of wires (d)";d
4490 SOUND 1,75,10,10
4500 Z=ROUND(276*LOG10(S/d+SQR((S/d)^2)-1)),2)
4510 CLS
4520 PRINT TAB(8)"OPEN WIRE LINE IMPEDANCE"
4530 PEN 1
4540 FOR A=1 TO 360 STEP 8
4550 DEG
4560 PLOT 220,150
4570 PLOT 220+25*COS(a),150+25*SIN(a)
4580 PLOT 360,150
4590 PLOT 360+25*COS(a),150+25*SIN(a)
4600 NEXT
4610 PEN 3
4620 LOCATE 17,16:PRINT CHR$(1)CHR$(8):LOCATE 19,16:PRINT"S":LOCATE 21,16:PRINT
CHR$(1)CHR$(9)
4630 LOCATE 26,14:PRINT"_":LOCATE 26,16:PRINT"d":LOCATE 26,18:PRINT"-"
4640 PEN 2
4650 LOCATE 10,10:PRINT "Impedance =" Z CHR$(191)
4660 SOUND 1,75,10,10
4670 PEN 1
4680 LOCATE 15,25: INPUT "More Y/N";a$
4690 a$=UPPER$(a$)
4700 IF a$="Y" THEN 4430
4710 IF a$="N" THEN 190
4720 REM
4730 REM ********************
4740 REM * COAX CABLE DATA *
4750 REM ********************
4760 REM
4770 CLS:PEN 1:MODE 2
4780 PRINT TAB(30)"COAXIAL CABLE DATA"
4790 LOCATE 1,4:PRINT"CABLE      Z   Attenuation (dB/100 ft.) at frequencies (MC/
s)  Capacity    Max "
4800 LOCATE 1,5:PRINT"                    1     10     50     100    200    400   1
000   pF/ft   V.rms"
4810 LOCATE 1,7:PRINT"RG-8A/U  50.0   0.16   0.55   1.3    1.9    2.7    4.1
8.0     30.5   4000"
4820          PRINT"RG-11A/U 75.0   0.18   0.66   1.6    2.3    3.3    4.8
7.8     20.5   5000"
4830          PRINT"RG-55A/U 50.0   0.30   1.2    3.2    4.8    7.0    10.0   1
6.5     29.5   1900"
4840          PRINT"RG-58U   53.5   0.33   1.25   3.15   4.6    6.9    10.5   1
7.5     28.5   1900"
4850          PRINT"RG-58C/U 50.0   0.42   1.4    3.3    4.9    7.4    12.0   2
4.0     30.0   1900"
4860          PRINT"RG-59A/U 75.0   0.34   1.1    2.4    3.4    4.9    7.0    1
2.0     20.5   2300"
4870          PRINT"RG-122   50.0   0.4    1.7    4.5    7.0    11.0   16.5   2
9.0     29.5   1900"
4880          PRINT"RG-174   50.0   2.3    3.9    6.6    8.9    12.0   17.5   3
0.0     30.0   1500"
4890          PRINT"RG-178B  50.0   2.6    5.6    10.5   14.0   19.0   28.0   4
6.0     28.5   1000"
4900          PRINT"RG-213/U 50.0   0.15   0.55   1.3    1.9    2.7    4.1
8.0     29.5   5000"
4910          PRINT"RG-214   50.0   0.21   0.66   1.5    2.3    3.3    5.0
8.8     29.5   5000"
4920          PRINT"RG-218/U 50.0   0.06   0.24   0.62   0.95   1.5    2.4
4.4     29.5   11000"
4930          PRINT"RG-223   50.0   0.3    1.2    3.2    4.8    7.0    10.0   1
6.5     29.5   1900"
4940 SOUND 1,75,10,10
4950 LOCATE 20,25:PRINT"Press any key to return to Main Menu"
4960 IF INKEY$="" THEN 4960
4970 GOTO 190
4980 REM
4990 REM ************************
5000 REM * STANDARD WIRE GAUGE *
5010 REM ************************
5020 REM
5030 CLS:PEN 1
5040 PRINT TAB(10)"STANDARD WIRE GAUGE"
5050 LOCATE 5,4:PRINT"S.W.G.    Ins.      S.W.G.    Ins."
5060 LOCATE 6,6:PRINT"30      0.0124      15      0.0720"
5070 LOCATE 6,7:PRINT"29      0.0136      14      0.0800"
5080 LOCATE 6,8:PRINT"28      0.0148      13      0.0920"
5090 LOCATE 6,9:PRINT"27      0.0164      12      0.1040"
5100 LOCATE 6,10:PRINT"26      0.0180      11      0.1160"
5110 LOCATE 6,11:PRINT"25      0.0200      10      0.1200"
5120 LOCATE 6,12:PRINT"24      0.0220       9      0.1440"
5130 LOCATE 6,13:PRINT"23      0.0240       8      0.1600"
5140 LOCATE 6,14:PRINT"22      0.0280       7      0.1760"
5150 LOCATE 6,15:PRINT"21      0.0320       6      0.1920"
5160 LOCATE 6,16:PRINT"20      0.0360       5      0.2120"
5170 LOCATE 6,17:PRINT"19      0.0400       4      0.2320"
5180 LOCATE 6,18:PRINT"18      0.0480       3      0.2520"
5190 LOCATE 6,19:PRINT"17      0.0560       2      0.2760"
5200 LOCATE 6,20:PRINT"16      0.0640       1      0.3000"
5210 SOUND 1,75,10,10
5220 LOCATE 3,25:PEN 2:PRINT"Press any key to return to Main Menu"
5230 IF INKEY$="" THEN 5230
5240 GOTO 190
5250 REM
5260 REM ****************************
5270 REM * FREQUENCY - WAVELENGTH *
5280 REM ****************************
5290 REM
5300 CLS:PEN 1
5310 PRINT TAB(6)"FREQUENCY/WAVELENGTH CONVERSION"
5320 PEN 2
5330 LOCATE 9,8:PRINT"1.Frequency to Wavelength"
5340 LOCATE 8,10:PRINT"2.Wavelength to Frequency"
5350 PEN 1
5360 SOUND 1,75,10,10
5370 PEN 3
5380 LOCATE 12,15:INPUT "Select Option";a
5390 IF a=1 OR a=2 THEN 5300
5400 IF a=1 THEN CLS:GOTO 5420
5410 IF a=2 THEN CLS:GOTO 5570
5420 PEN 1
5430 PRINT TAB(8)"FREQUENCY TO WAVELENGTH"
5440 PEN 2
5450 SOUND 1,75,10,10
5460 LOCATE 5,8:INPUT "What is the Frequency in MHz";F
5470 L=ROUND(300/F,2)
5480 PEN 1
5490 LOCATE 10,12:PRINT F "MHz = " L "Metres"
5500 SOUND 1,75,10,10
5510 PEN 3
5520 LOCATE 15,25:INPUT "More Y/N";a$
5530 SOUND 1,75,10,10
5540 a$=UPPER$(a$)
5550 IF a$="Y" THEN 5300
5560 IF a$="N" THEN 190
5570 PEN 1
5580 PRINT TAB(8)"WAVELENGTH TO FREQUENCY"
5590 PEN 2
5600 SOUND 1,75,10,10
5610 LOCATE 2,8:INPUT "What is the Wavelength in Metres";L
5620 F=ROUND(300/L,2)
5630 PEN 1
5640 LOCATE 10,12:PRINT L "Metres =" F "MHz"
5650 GOTO 5500
5660 MEMORY 41999
5670 FOR i=42000 TO 42189:READ a$:v=VAL("&"+a$):csum=csum+v:POKE i,v:NEXT i
5680 IF csum<>26226 THEN PRINT CHR$(7):PEN 2:PRINT"Data Checksum Error - check l
isting!":PEN 1:STOP
5690 CALL 42000:PRINT CHR$(255):CLS
5700 DATA 2A,5B,BB,22,E1,A4,21,27,A4,22,5B,BB,3E,C3,32,5A,BB,3E,CF,32
5710 DATA E0,A4,E9,F5,E5,D5,C5,32,E4,A4,FE,20,38,35,FE,FF,20,07,3E,00
5720 DATA 32,E3,A4,18,25,FE,FE,20,07,3E,FF,32,E3,A4,18,1A,3A,E3,A4,FE
5730 DATA 00,28,08,3A,E4,A4,CD,79,A4,18,08,C1,D1,E1,F1,3A,E4,A4,CD,E0
5740 DATA A4,C9,C1,D1,E1,F1,C9,FE,0A,20,EC,3A,E3,A4,FE,00,28,E5,3E,0A
5750 DATA CD,E0,A4,18,DE,47,CD,A4,A4,CD,78,BB,CD,87,BB,22,CE,A4,7D,FE
5760 DATA 01,20,04,2C,22,CE,A4,2D,CD,75,BB,7E,FE,CD,5D,BB,2A,CE,A4,CD
5770 DATA 75,BB,3E,FF,CD,E0,A4,C9,CD,05,B9,E5,78,CD,A5,BB,06,08,11,D0
5780 DATA A4,7E,12,13,12,27,13,10,FA,F1,CD,0C,B9,3E,FE,21,D0,A4,CD,AB
5790 DATA BB,3E,FF,21,DB,A4,CD,A8,BB,C9
5800 RETURN
```

COMPUTER CONTESTS

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Use two computers for the next contest — why use one computer when you can use two?

Contests are a natural application of computers to amateur radio. After all, the purpose of a contest can be stated as gathering data, (the calls and reports of stations worked) in such a way as to avoid duplicates. When working contests in a manual (non-computer) mode, if you desire to avoid duplicates, you usually have to keep two sets of records for each contact. The log entry has to be made, and a duplicate sheet of some kind has to be kept to give real time notice of potential duplicate contacts.

Major contest operators do things *quickly*. When one is working a pile-up, the calls have to be logged quickly and accurately: *duplicates have to be weeded out speedily*. For that reason, the job of contest logging is dedicated to one computer. If the station log, comprising general QSO data, as well as logs of past contacts, is available on disk, a second computer can be used to scan that log in real time, and notify the operator of previous contacts. This is a great piece of one- up manship, for now you can not only tell other stations that the QSO is a duplicate, you can also tell them when you last worked, ask them if they have received your OSL card, and *why haven't they sent you one?* if you have the time and inclination.

REQUIREMENTS FOR A GOOD CONTEST PROGRAM

The use of a good contest logging program simplifies the paper work during and after a contest and allows the operator to concentrate on working stations. During the contest, the operator has only to perform the following tasks.

* *Enter the call sign of the station worked.*
* *Enter the report received.*
* *Tell the computer to log the contact.*

The computer takes care of the rest of the data handling. The computer thus performs the following tasks.

* *Keeps a check list in memory to notify the operator if a contact has been made on the same (duplicate) or another band.*
* *Updates date and time information automatically.*
* *Stores the contact data in a floppy disk file.*

Consider the two programs needed to provide this capability and the linkage between them.

The contest logging program gives the operator the following choices.

C *Enter the Call of the station to be, or being worked. When the call is entered, the computer will perform a check to see if the call has already been worked and if so, on what band. If the call has been worked on the band in use at that time, it will also display the word* **DUPLICATE.**

Figure 1 — Contest.

```
10 ON ERROR OOTO 950
20 89='832C2 CONTEST LORGING PROGRAN VERSION J.98':CLS:NIDTH 00:LOCATE 10,1:PRINT 00
30 BANDS=7:H9=4006:DIM B0(89),F1(H9),D(BANDS),B1(BANDS):810='00':818="59":C0="?"
40 BLANK0='                                                                    '
50 C48='DXVBMCFL#/8?':L06=BLAIK0:0S0='-':0R8=0S0:H0=818:80=818:L18=L00:L28=L00:L00=L08:L06=L06
60 L58=L06:L68=L06:L78=L06:L88=L06:L138=L06:L128=L08:L118=L06:L108=L06:L98=L06
70 FOR I%=1 TO BANDS:READ B(I%):NEXT:DATA 1,4,14,64,256,1024,4094
80 FOR I%=1 TO BANDS:READ B1(I%):NEXT:DATA 10,15,20,40,80,140,2
90 LOCATE 12,1:INPUT 'Enter name of 100 file (D:NAME) Log type .L00 assumed ',LD:IF L8="" THEN 90
100 OOSUB 880
110 OPEN L8+".D08' FOR OUTPUT AS 82
120 OPEN L8+".LOG' FOR INPUT AS D1:OOTO 140
130 GOSUB 380 :GOSUB 390 :GOSUB 420:GOTO 800
140 LOCATE 23,1:PRINT 'LOADINS LAST ENTDT STRINGS':OPED L8+".CHK" FOR INPUT AS 83
150 INPUTD3,L138,L128,L118,L108,L98,L98,L78,L68,L58,L48,L08,L28,L18:CLOSE03
160 PRINT 'OPENING LOGBOOK ';L8:N4=0
170 IF EOF(1) THEN GOSUB 650:INPUT'Waiting,touch ENTER to continue ';B6:OOTO 800
180 INPUTD1,D8,T0,D8,CD,D8,D8,D8,D8,OS8,OR8,D8 : PRINT N4,CD,X8:IF C8="/#" THEN N4=N4-1 ELSE N4=N4+1
190 GOSUB 270:V8(J)=C8:F=VAL(D8):FOR 0%=1 TO BANDS:IF J8?(F)=B1(0%) THEN F1(J)=F1(J)+B(B%):GOTO 210
200 NEXT
210 PRINT82,D8;",";T8;",";D8;",";C8(",";R8;",";S8;",";D8(",";P8;",";D98;",";OR0|",";X8:GOTO 170
220 LOCATE 20,1:PRINT BLANK0:LOCATE 20,1:RETURN
230 LO8=BLANK0:MID8(LD8,6)=D8:MID8(LD8,15)=T8:MIDD(LD8,20)=CD:MID8(L00,32)=88:MID8(L08,36)=D8:MID8(L00,40)=P0
240 IF C8="/#" THEN MID8(L00,1)="-" ELSE N48=STR8(N4):MID8(L00,1)=MID8(N48,2)
250 MID8(L08,45)=R8:MID8(L08,49)=S8:MID8(L0D,53)=QS8:MID8(L0D,55)=OR8:MID8(L08,57)=X0:RETURN
260 T8=LEFT8(TIME8,2)+MID8(TIME8,4,2):D8=RIGHT8(DATE8,2)+"/"+LEFTD(DATE8,2)+"/"+MID8(DATED,4,2):RETURN
270 J=0:IF C8="/#" THEN 350
280 FOR I%=1 TO LEN(C8):B8=MID8(C8,I%,1):J=J+(ASC(B8)-47):NEXT:I=J*25:IF J<0 THEN J=0
290 IF J>H9 THEN J = J-H9 : GOTO 290
300 IF LEN(B8(J))<1 THEN 350
310 IF LEFT8(V8(J),1)=" " THEN 380
320 IF LEFT8(D8(J),LEN(C8))=C8 THEN 340
330 J=J+1:GOTO 290
340 I=0:RETURN
350 I=1:RETURN
360 INPUT 'REPORT RECEIVED ';X8:RETURN
370 GOSUB 220:INPUT 'REPORT SENT     ';S8:IF S0>"599" THEN 370 ELSE RETURN
380 SOSUB 220:INPUT 'POWER (watts)   ';R8:IF P8<"0" THEN 380 ELSE RETURN
390 SOSUB 220:INPUT 'BAND            ';F : IF F>106 THEN 390
400 FOR I%=1 TO BANDS:IF INT(F)=B1(I%) THEN 410 ELSE NEXT:LOCATE 22,1:FOR I%=1 TO BANDS:PRINT B1(I8!)" ";:NEXT:GOTO
410 B8=MID8(STR8(F),2):B8=I%:GOSUB 650:RETURN
420 SOSUB 220:INPUT 'MODE            ';R8: IF R8="" THEN 420 ELSE RETURN
430 GOSUB 220:INPUT 'CALL SIGN       ';A8
440 IF A8="" THEN 430 :IF LEFT8(A8,1)="" THEN A8=LEFT8(A8,LEN(A8)):GOTO 440
450 LOCATE 22,1:PRINT BLANK8: LOCATE 22,1:C8=A0:GOSUB 270:IF I=1 THEN PRINT "NE":GOTO 510
460 F2=F1(J): PRINT 'WORKED on ';
470 FOR B%=BANDS TO 1 STEP -1: IF F2<B(B%) THEN 500
480 PRINT B1(B%);" ";:F2=F2-B(B%):IF B1(B%)=INT(F) THEN PRINT 'DUPLICATE';CHR8(7);
490 IF F2>=B(B%) THEN 470
500 NEXT
510 RETURN
520 GOSUB 220:INPUT 'ARE YOU SURE ';B8 :IF A0="" THEN RETURN
530 IF N4<1 THEN GOSUB 220 : PRINT 'CAN'T FORGET A ZERO ENTRY':RETURN
540 IF A8=""OR LEFT8(B8,1) <> "T" THEN RETURN
550 C8=C88:GOSUB 270:F1(J)=F1(J)-B(B8):IF F1(I)<=0 THEN B8(I)=" "
560 C8="/#":GOTO 600
570 IF LEN(X8)=0 THEN 580 ELSE IF LEFT8(C8,1)="?" THEN 580 ELSE 590
580 LOCATE 22,1:PRINT BLANK8: LOCATE 22,1:PRINT 'GET THE DATA FIRST':RETURN
590 C88=C8:GOSUB 270: F1(J)=F1(J)+B(B%):V8(J)=C8
600 PRINT82,D8;",";T8;",";D8|",";C8|",";R8|",";S8|",";H8;",";P8|",";Q58;",";O88;",";X8
610 IF C8="/#" THEN 620 ELSE N4=N4+1:GOTO 630
620 N4=N4-1:IF N4<0 THEN N4=0
630 GOSUB 230:L138=L128:L128=L118:L118=L108:L108=L98:LOCATE 1,5:PRINT 00
```

```
640 L9$=L8$:L8$=L7$:L7$=LA$:L6$=LB$:L5$=LC$:L4$=LD$:L3$=LE$:L2$=LF$:L1$=LG$:L0$=LH$:GOSUB 660
650 C$="?":R$=R1$:S$=S1$:X$="":RETURN
660 I=3:GOSUB 700:PRINT L13$:I=4:GOSUB 700:PRINT L12$:I=5:GOSUB 700:PRINT L11$:I=6:GOSUB 700:PRINT L10$
670 I=7:GOSUB 700:PRINT L9$:I=8:GOSUB 700:PRINT L8$:I=9:GOSUB 700:PRINT L7$:I=10:GOSUB 700:PRINT L6$
680 I=11:GOSUB 700:PRINT L5$:I=12:GOSUB 700:PRINT L4$:I=13:GOSUB 700:PRINT L3$:I=14:GOSUB 700:PRINT L2$
690 I=15:GOSUB 700:PRINT L1$:RETURN
700 LOCATE I,1:PRINT BLANK$:LOCATE I,1:RETURN
710 GOSUB 220:INPUT "ARE YOU SURE ";A$:IF A$="" THEN RETURN
720 IF LEFT$(A$,1)<>"Y" THEN RETURN
730 CLS:PRINT "SAVING LAST ENTRY STRINGS BEFORE CLOSING":OPEN L$+".CHK" FOR OUTPUT AS #3
740 PRINT#3,L1$;",";L2$;",";L3$;",";L4$;",";L5$;",";L6$;",";L7$;",";L8$;",";L9$;",";L0$;",";L1$
750 CLOSE#3:CLOSE#1:CLOSE#2
760 KILL L$+".BAK"
770 NAME L$+".LOG" AS L$+".BAK"
780 NAME L$+".DAT" AS L$+".LOG"
790 GOTO 1000 : REM END
800 GOSUB 880: LOCATE 1,5:PRINT C$;L$:GOSUB 660
810 LOCATE 17,30:PRINT "CURRENT ENTRY":GOSUB 260:GOSUB 230
820 N1$=L0$,1)=STR$(N+1):LOCATE 18,1 : PRINT BLANK$:LOCATE 18,1 : PRINT STR$(N+L),C$,X$
830 GOSUB 220:INPUT "BRU ";A$:IF A$=""THEN 830
840 FOR I2%=1 TO LEN(C4$):IF LEFT$(A$,1)=MID$(C4$,I2%,1) THEN 850 ELSE NEXT:GOTO 830
850 GOSUB 220:ON I2% GOSUB 360,370,380,390,420,430,520,570,710,890,870,860:GOTO 810
860 LOCATE 21,1:PRINT BLANK$:PRINT BLANK$:PRINT BLANK$:RETURN
870 LOCATE 22,1:PRINT L0$:RETURN
880 CLS:KEY OFF:LOCATE 25,1:FOR I = 1 TO LEN(C4$):PRINT MID$(C4$,I,1);" ";:NEXT:RETURN
890 GOSUB 220:INPUT "ARE YOU SURE ";A$:IF A$="" THEN RETURN
900 INPUT "SWITCH PREFIX ";A$:IF LEN(A$)<1 THEN A$="@"
910 I%=0:FOR @=1 TO N:IF LEFT$(B$(@),1)<>"*" THEN 940
920 IF A$="*" THEN 930 ELSE IF A$=LEFT$(B$(@),LEN(A$)) THEN 930 ELSE 940
930 PRINT V$(@),:I%=I%+1:IF I%=4 THEN I%=0:PRINT
940 NEXT:PRINT:INPUT "READY WHEN YOU ARE, HIT ENTER TO CONTINUE";A$:CLS:GOSUB 880:GOSUB 660:RETURN
950 IF ERL = 120 THEN OPEN L$+".LOG" FOR OUTPUT AS #3:CLOSE#3:OPEN L$+".LOG" FOR INPUT AS #1:RESUME 130
960 IF ERL=140 THEN PRINT "CHECK LIST ERROR, RECOVERING....":RESUME 160
970 IF ERL = 760 THEN RESUME 770
980 PRINT "ERROR ";ERR;" AT LINE ";ERL
990 REM RESUME 800:REM CLOSE DOWN IN AN ORDERLY MANNER
1000 END
```

R Enter the Report received into the log.
L Enter the QSO information into the Log Book/check list. The data is written into the log file in ASCII format delimited with commas. This makes it easy to modify with a word processor and read into the program used by the second computer. You may also list the contents of the log file to the screen under DOS using the ***TYPE*** *command.*
F This command is used to Flag an erroneous log entry. Since the log on disk is a sequential file, and the log data is not double buffered by the program, once an entry is written to the log, it is gone. This command deletes the call from the check list and puts a / entry into the log book. You may use your favourite word processor (in the non-document mode) to delete that entry and the previous one from the log book when the contest is over.*
Q Check the log entry data on the screen before saving it in the log file. This command may be used, for example, to verify that the correct band data is set after changing bands.
X Enter the signal report X-mitted to the other station into the log.
/ This command is used to scan the contents of the check list for prefixes. You use this when you are sure that you have worked a station but the computer tells you that you haven't. You may also use it to check if a prefix has been worked as a help in deciding if you want to get into a pile-up or pass it by
The computer will prompt you to enter a prefix. If you want to look at all the calls in the check list, enter an asterisk as *the desired prefix and you will get a list of every call in the check list in the order in which they were put into the check list.*
W Enter the Transmitter Power used in Watts into the log book.
M Enter the Mode used in the contest in the log. You may enter anything, but the most commonly used ones are SSB and CW.
** This command terminates the program. It saves the data associated with the last 12 contacts in a file with the* ***.CHK*** *extension so that when the program is re-started, the operator will not even notice that a break occurred. The disk files are closed and any previous file present from the start of the session is named as a back-up file.*
? This command clears the screen dialog lines. It is normally used rarely, only in the event that the BASIC interpreter generates an error message in response to a user input. The typical one normally seen is *REDO FROM START* which results from an alphabetical response to the *BAND* command, where *BASIC* is looking for a number, not a string.

THE DATA-BASE (log book) SEARCH PROGRAM

The second program is run on a second computer. It contains the logs of previous contacts in one large data-base. As the contest logging program is being run, whenever the operator enters a call sign to be checked, the same call sign is output to the second computer and a search of the data-base (old logs) is made to see if the call is in the log. If it is, all previous contacts are listed, if not, a message to that effect is displayed. If the two CRTs are placed side-by-side, then all the information is available to the operator literally at a glance. Consider what additional information the operator has *on-line.*
** All previous contacts with any one station.*
** By entering the prefix for a particular country, all contacts with that country (and more important, the QSL status for DXCC purposes) made before the contest may be seen. This is an aid for deciding whether to join or stay in a pile-up for a DX contact.*

The use this information will be put to depends on the reason you are in the contest. If you are looking for new countries, you will know who to call. If you want to win and make many new contacts, you still have the option to spend a little time to pick up new ones. I find that I do recognise certain calls and exchange greetings on an annual basis. With this program, I can recognise all previous contacts and remind the other station of the fact. Perhaps contest contacts may become a little more than a rubber stamp QSO, at least among regulars.

THE CONTEST LOGGING PROGRAM

The Contest Logging Program listed in Figure 1 is a stand-alone program. That means that it may be run as is, without the second (data-base) program. It is the latest version (at the time of writing) of several generations of contest logging programs. This version is written in *BASIC* for the IBM-PC and compatible family of computers. The following brief outline is presented as an aid to following the operation of the program.

10 *Error trapping vector*
20 *Heading*
30 *Setting up and defining parameters (space for 4000 contacts). The following bands are recognised: 10; 15; 20; 40; 80; 160; 2.*
90 *Enter name of log file. It is usually the name of the contest, such as WPX85, or RD85. The program adds the file extension* ***.LOG*** *automatically, and creates a backup (****.BAK****) as needed.*
110 *Open the disk files.*
140 *Reads the previous contacts into the log, after the program has been terminated during a break in the contest operation.*
220 *Subroutine to reset the prompt line.*
230 *Subroutine to set up the current data line.*
260 *Subroutine to re-arrange the date and time strings.*
270 *Subroutine to check if the call has already been worked.*
360 *Subroutine to accept the report received.*
370 *Subroutine to accept and override the default report-sent information.*
380 *Subroutine to set up the 'power' information for the log.*
390 *Subroutine to set up the 'band' information for the log/check list.*
420 *Subroutine to set up the 'mode' information for the log.*
430 *Subroutine to accept and process the call of the station being worked.*
520 *Subroutine to fudge a contact.*
570 *Subroutine to log the contact (puts the data in the log and check list).*
600 *Subroutine to display string data of previous 12 contacts on screen.*
710 *Subroutine to terminate the program, and name the log files properly. The last 12 contacts are saved in a file with the* ***.CHK*** *extension so that the display when the program is restarted will appear as if the break had never taken place.*
800 *Main loop.*
860 *Subroutine to clear the screen dialog area.*
670 *Subroutine to display the data associated with the contact (QSO) in progress (current contact).*
880 *Subroutine to display prompt line at bottom of screen.*
890 *Subroutine to display all calls in the check list, in the order that they are in the list.*

950 *Subroutine to perform error trapping and recovery.*

The variables and parameters used in the program perform the following tasks.

B()	*Binary code for each band.*
B%	*Index into B() and B1() for Band in use.*
B1()	*Bands.*
BANDS	*Number of Bands recognised.*
F	*User Band information.*
F1()	*Part of Check List for band that QSO was made on.*
F2	*Temporary band information for scanning check list.*
I%	*General integer variable.*
J	*General variable (index into check list).*
M9()	*Size of check list (maximum number of QSOs).*
N4	*Valid QSO count.*
Q%	*General integer variable.*
A$	*User Answer String (holds operator input).*
BLANK$	*Line of space characters.*
B$	*Band.*
C$	*Call of station being worked.*
C4$	*String containing allowable command characters.*
C8$	*Call of previous contact.*
D$	*Formatted date.*
DATE$	*BASIC date string.*
G$	*Title.*
L$	*Name of contest log book.*
L0$	*Current QSO line.*
L1$-L13$	*Previous QSO lines.*
M$	*Mode*
N4$	*Temporary QSO number string.*
P$	*Transmitter power.*
QR$	*QSL received information.*
QS$	*QSL sent information.*
R$	*Report received.*
R1$	*Default report value.*
S$	*Report transmitted.*
S1$	*Default transmitted report value.*
T$	*Formatted time string.*
TIME$	*BASIC time string.*
W$()	*Calls worked (check list).*
X$	*Comments (used to hold received contest data).*

THE DATA-BASE SEARCH PROGRAM

The second program is written in DBASE2 and assumes that the main station log book is kept in an indexed DBASE2 data file with the following structure.

FLD	Name	Type	Width	Comment
001	**DATE**	C	*008*	Date on format YY/MM/DD
002	**TIME**	C	*004*	Time in format HHMM
003	**BAND**	C	*003*	Band; eg 10, 20, 40
004	**CALL**	C	*010*	Call sign
005	**RX**	C	*003*	Signal report received
006	**TX**	C	*003*	Signal report transmitted
007	**MODE**	C	*004*	Mode of QSO; eg SSB, FM
008	**POWER**	C	*004*	Transmitter power
009	**QSL$ENT**	C	*001*	QSL sent information; eg B (bureau)
010	**QSLRX**	C	*001*	QSL received information; eg R (received)
011	**Comments**	C	*010*	Comments and notes

The index is given the same name as the log file using the statement *INDEX ON CALL TO log book* where *log book* is what you called the log. The floppy disk will thus hold two files, namely the actual data-base *(LOGBOOK.DBF)* and the index file *(LOGBOOK.NDX)*.

The DBASE2 program to find the call in the data-base log is listed in Figure 2. The reason that it is so small is because DBASE2 is a great language for playing with data. The program starts by initialising the variables and then enters a loop. The loop accepts a call sign or prefix from the terminal and searches the log for it. If one is found, all calls beginning with the prefix are displayed. If the prefix or call is not found, a message to that effect is also displayed. The loop terminates when an asterisk is entered as the call sign, which is the same code for terminating the contest program.

INTERFACING THE PROGRAMS

Up to now, two programs running on separate computers have been described. In order to make them work together they have to be interfaced. This interface task is a custom task and may have to be performed in a different manner for different computer pairs. The Contest Program has to modified to output the call sign to the second computer. It is recommended that this be done via the RS-232 Communications Port. Line 115 should be added to *OPEN* the relevant communications port (COM1 or COM2 at the Baud rate desired or as needed by the second computer). Line 445 should also be added to output the call sign (C$) as each new call is entered by the operator. Error trapping should be added at line 965 so that if something goes wrong with the RS-232 interface or the second computer, the contest program does not bomb, but will continue to work in a degraded manner in which the extra facility provided by the second computer is no longer available. It would also be good practice to add line 755 to close the communications link when the program is terminated. Typical examples are:

```
125 OPEN "COM1:1200,N,8" AS #4
525 PRINT #4,C$
845 CLOSE #4
965 IF ERL = 445 THEN RESUME 450
```

In this example, the serial port is opened as a 1200 Baud, no parity, eight data bits and one stop bit communications line.

The second computer should preferably be one with a separate RS-232 CRT terminal. If this is the case, its interface cable can be modified by removing the wire from the keyboard and routing it to the serial port connector of the first computer instead. Many eight bit machines run CP/M-80 and DBASE2.

A program, possibly also in BASIC, should be run on the contest computer so that it acts as a remote terminal so as to start-up the second computer, load DBASE2 and enter the *CALLFIND* command. As this is a software article there is not really space to describe the customisation process in detail. If you are not sure of what to do, there is probably someone in your local club who could advise you.

GETTING DATA INTO THE DATA-BASE

In order to use the two programs together, the DBASE data-base should have some data in it. This means that entries from old log books need to be copied into the computer. If the log is large it may take a long time to do that job (a great way to spend your time while "reading-the-mail"), so a DBASE2 program called *UPDATE* listed in Figure 3 may be used to speed-up matters. This update program is optimised for entering data from old contest logs into the DBASE2 data-base.

The first entry should be made manually using the *APPEND* command in an interactive manner to set the date, mode and power information. The *UPDATE* program is then

Figure 2 — Find Program.

```
*CALLFIND VERSION 85-09-10 (STAND ALONE VERSION)
@LOCAL VARIABLES callflag,callheard
SET TALK OFF
USE logbook INDEX logbook
STORE T TO callflag
*MAIN LOOP
DO WHILE callflag
    GOTO TOP
    ACCEPT "Call/Prefix (* To terminate) ? " to callheard

    IF callheard = "*"
        STORE F TO callflag
        * CLEAR LOOP CONTROL FOR EXIT
    ELSE
        ERASE
        ? "Log entries for CALL PREFIX = ", callheard
        ?
        ? " ENTRY"
        ?? "  CALL      DATE   TIME BND TX  RX  MDE  S R  COMMENTS"
        ? "-------------------------------------------------------"
        FIND &callheard
        IF @ = 0
            @ 5,1 SAY callheard
            @ 5,12 say "does not appear to be in the log"
        ELSE
            DO WHILE call = callheard .AND. (.NOT.EOF)
                ? @,call,data,time,band,rx,tx,mode,qslsent,qslrx,comments
                SKIP
            ENDDO
        ENDIF
    ENDIF
* RESET POINTERS
GOTO TOP
ENDDO
* GET READY TO EXIT
RELEASE callflag,callheard
RETURN
```

```
*LOGUPDATE VERSION 850911
*UTILITY TO ENTER CONTEST LOG DATA INTO DATABASE BY BAND

SET TALK OFF

USE logbook

STORE T TO callflag

GOTO BOTTOM
STORE call TO lastcall

*INITIALISE NEW VARIABLES
STORE date to adate
STORE time TO atime
STORE band TO aband
STORE power TO apower
STORE mode TO amode
STORE rx TO arx
STORE tx TO atx

SET INDEX TO logbook

*MAIN LOOP
DO WHILE callflag
  ERASE
  STORE "-" TO qslsent
  STORE "-" TO qslrx
  STORE "          " TO acall
  STORE "          " TO acomments
  STORE " " TO logflag
  STORE T TO dataflag

  DO WHILE dataflag
    @ 10,1  SAY "LAST CONTACT WAS"
    @ 10,20 SAY lastcall
    @ 12,1  SAY "DATE"
    @ 13,1  SAY "TIME"
    @ 14,1  SAY "CALL"
    @ 15,1  SAY "BAND"
    @ 16,1  SAY "POWER"
    @ 17,1  SAY "MODE"
    @ 18,1  SAY "REPORT (RX)"
    @ 19,1  SAY "REPORT (TX)"
    @ 20,1  SAY "COMMENTS"
    @ 23,1  SAY "Logit (ESC)"

    @ 12,13 SAY adate
    @ 15,13 SAY aband
    @ 16,13 SAY apower
    @ 17,13 SAY amode
    @ 18,13 SAY arx
    @ 19,13 SAY atx

    @ 13,13 GET atime
    @ 14,13 GET acall
    @ 20,13 GET acomments
    @ 23,13 GET logflag
    READ

    DO CASE

    CASE logflag = "*"
         STORE F TO callflag
         STORE F TO dataflag


    CASE logflag = "L"
         BLOG ENTRY
         APPEND BLANK
         STORE  F          TO  dataflag
         REPLACE qslsent   WITH aqslsent
         REPLACE qslrx     WITH aqslrx
         REPLACE date      WITH adata
         REPLACE time      WITH atime
         REPLACE call      WITH acall
         REPLACE band      WITH aband
         REPLACE power     WITH apower
         REPLACE mode      WITH amode
         REPLACE rx        WITH arx
         REPLACE tx        WITH atx
         REPLACE comments  WITH acomments
         STORE call        TO  lastcall
         STORE "           " TO  acall
         STORE "           " TO  acomments

    CASE logflag = "B"
         @ 15,12 GET aband

    ENDCASE
  ENDDO
ENDDO

* GET READY TO EXIT

RELEASE logbook,callflag,lastcall,adate,atime,aband,apower
RELEASE amode,arx,atx,aqslsent,aqslrx,acall,acomments
RELEASE logflag,dataflag

RETURN
```

Figure 3 — Update Program.

invoked by the *DO UPDATE* statement. After the contact data for each QSO has been input, the program prompts for a decision. It gives the operator the choice of three things to do as follows.

* *Terminate the program.*
L *Log the entry into the data-base.*
B *Change the band information.*

It must be repeated that this program is designed for rapid entry of old contest logs into the data-base, logs in which the only differences between one entry and the next are the time, call sign, and reports, with the occasional change of band. Any other data must be set, or changed, using DBASE features.

After the data is in the data-base, use the following statements to massage the data a little. To duplicate the report from the comments column to the report column use the following interactive command.

REPLACE ALL rx WITH $ (comments,1,3) then to delete the report from the comments column use this statement,

REPLACE ALL comments WITH $ (comments,3,10)

If you want as serial number added to each comment line, perform the *NUMBER* command listed in Figure 4. This program is an example of string handling in DBASE2.

```
* NUMBER ADDS NUMBER TO COMMENTS
SET TALK OFF

STORE 1 TO qsocount

USE logbook

DO WHILE .NOT. EOF
   STORE STR(qsocount,10) TO number
   DO WHILE $(number,1,1) = " "
      STORE $(number,2,10) TO number
   ENDDO
   REPLACE comments WITH TRIM(number)+comments
   STORE qsocount + 1 TO qsocount
   ? call
   ?? comments
   SKIP
ENDDO

RELEASE qsocount,number
RETURN
```

Figure 4 — Number Program.

POST CONTEST DATA-BASE UPDATES

Once the contest is over, the log file must be corrected using a word processor to delete any fudged entries. A program to do this job was available in the original package described in my book *Software for Amateur Radio* (TAB BOOKs number 1560), but has not been converted to Microsoft BASIC because it was found that some editing was always performed on the logs and why not delete the error lines at the same time.

Serial numbers can be added to the comment space in the log and the report area set properly by the *LOGCONV* program listed as Figure 5. This program reads each line of log information, strips the report part from the comments and puts it into the report space (line 110) and adds the serial number of the contact into the comments space (line 120). When the program has done its job, the original log has been renamed with a **.RUN** file extension while the converted log data file has the extension **.LOG.**

The log file is now ready to be converted to a DBASE format file for further processing. If the second machine, that contains the data-base is not an IBM-PC or compatible, the contest **.LOG** file has to be transferred to a disk that the second machine can read using one of the format transfer programs readily available.

First invoke DBASE. Next generate a blank log book data-base file either by **CREAT**ing one with the same structure as the big one, or copying the structure of the big one onto the new one as follows:

USE log book
COPY STRUCTURE INTO contest
USE contest
INDEX ON call TO contest

The contest log is then appended to this data-base log file using the DBASE statement **APPEND FROM contestlog.LOG SDF DELIM** which will copy the log data into the data-base.

You can then display, or print, the call signs in the contest log in alpha-numerical order to check for duplicates, prefixes or whatever. You may even get displays of contacts on different individual bands by using variations of the DBASE command **DISPLAY ALL FOR BAND** = "xx" ' where xx is the band you want displayed.

The temporary contest log data-base can then be appended to the main station log book data-base with the following two statement.

USE logbook INDEX logbook
APPEND FROM contest

The main log book data-base is then ready for the next contest or any further data-processing and analysis desired.

SUMMARY

This article has shown how two computers, each running separate programs written in different languages, may be linked together into a multi-tasking operation during an amateur radio contest. If two machines are not available, it is still worthwhile to use the programs separately in series. The contest program is run during the contest, the data then transferred to the data-base file format and checking can commence. Other programs written in DBASE2 may then be used to generate DXCC records, perform QSL functions, or what you will!

FOOTNOTE: Joe Kasser was first licensed as G8BTB in 1968, and received his current call sign in 1970. His interests in amateur radio are wide-ranging and cover everything from QRP to satellites. He served as the editor of AMSAT's publications from 1974 to 1981. He has many magazine articles and two books, on the subject of micro-computers and amateur radio, to his credit. His latest efforts are the applications of micro-computers to amateur radio. At present he is an international consultant in the fields of micro-computers, systems and electronics.

AR

```
10 WIDTH 80:PRINT "LOG CONVERSION PROGRAM 2.0"
20 REM CONVERTS CONTEST LOG TO STANDARD LOG
30 INPUT "WHAT IS THE LOG NAME ";L$
40 CLS:N=1
50 OPEN L$+".$$$" FOR OUTPUT AS #2
60 OPEN L$+".LOG" FOR INPUT AS #1
70 IF EOF(1) THEN 160
80 INPUT#1,B$,T$,D$,C$,R$,S$,N$,P$,QS$,QR$,X$
110 R$=LEFT$(X$,2):B$=STR$(N):N$=MID$(N$,2)
120 X$=MID$(X$,3,LEN(X$)):X$=N$+"-"+X$:N=N+1
130 PRINT#2, B$;",";T$;",";D$;",";B$;",";R$;",";R$;",";B$;",";D$;",";QB$;",";RR$
140 PRINT B$;",";T$;",";B$;",";C$;",";R$;",";S$;",";R$;",";P$;",";QS$;",";QR$
150 GOTO 70
160 CLOSE#1 : CLOSE#2
170 NAME L$+".LOG" AS L$+".RUN"
180 NAME L$+".$$$" AS L$+".LOG"
190 END
```

Figure 5 — Log Conversion Program.

Thumbnail Sketches

Alan Shawsmith VK4SS,
WIA QUEENSLAND HISTORIAN
35 Whynot Street, West End, Qld. 4101.

FRANK NOLAN VK4JU (SK)
Not to be confused with VK4FN — Funny Noises

The fraternity has always had its share of colourful characters and one of Queensland's best known in the 30s was Frank VK4JU. He will be remembered by his rather uncertain on-air temperament; at times Frank's mood could change by the hour — like the infamous Melbourne weather. However, all this was far outweighed by his contributions to amateur radio.

Technically quite knowledgeable, he had the uncommon ability of being able to impart knowledge clearly and could have been a competent teacher. Franks claimed to have coached the first-ever young lady to become a PMG telegraphist in VK4. His own *fist* was impeccable and the same standard was expected from others — sloppy senders were not tolerated.

DXing and contests occupied much of his time and, considering his poor QTH, his achievements were outstanding. He reacted strongly in a very individual way to QRM, often returning it with interest. VK4JU lived less than two blocks from Brisbane's main city thoroughfare, Queen Street, and a steady stream of motor cars and trams passed his front door. Industrial machines and appliances crowded him on all sides, as did the tin roofs of buildings, consequently his receiver emitted a continuous S9 level of QRN. The tower of Broadcasting Station 4BK stood nearby and radiation from it threw a wide rough distorted harmonic right in the best part of the 14 MHz DX-band.

DC input allowed at the time was 25 watts and the PMG expected it to be observed within reasonable limits. Frank would testily insist that on 20 metres hardly any of this power got into the sky hook proper, so great was the RF absorption. In order to overcome such an unjust handicap, VK4JU resorted to the *big bottle* capable of handling 150-200 watts DC input; this, in it turn, led to the creation of a certain amount of BCI in the sets of BCLs close by.

Pre-war, most RIs dropped in unannounced — and so it was that Frank was caught — with his big bottle up in place for all to see. It also happened that Cedric VK4CJ was present at the time. Frank, visibly agitated, produced a handful of silver from his pockets and whispered to Cedric from the side of his mouth; *"Quick, whip out and buy a decent sized bag of mixed fresh fruit"*.

Benign bribery, be it in any form of hospitality or favour, is practiced by everyone daily; maybe it is as simple as offering as extra cup of tea to achieve some end. Just what VK4JU's motives were will never now be known — but what is known is that Cedric VK4CJ, through no fault of his own, failed in his mission. No fruit shop being at hand, the best that Cedric could come up with was a retarded, green, sickly-looking bunch of bananas. He dutifully delivered these to Frank and sensing the possible development of an issue over the big bottle — now removed from the rig — he absented himself from the fruity drama. VK4JU was left expounding his inverted logic on how 150 watts at his QTH was only equal to 25 watts elsewhere.

Frank remained one of VK4's most active amateurs, becoming well-known internationally. Some years after the conclusion of WWII, he QSYed to the suburb of Randwick, Sydney, in New South Wales, where he took out a VK2 call sign and his sending, a little slower, but still immaculate, was heard for many more years. Like old wine, he mellowed with maturity and eventually died quietly in his sleep in his 70th year — one of the real characters of the early days.

AUTHORS NOTE: *During a visit to VK4JU's shack, Frank sent out a CQ in his most perfect code. A local replied in a dreadfully sloppy fist. "Just listen to that," said Frank in utter disgust, "that's an insult to Samuel Morse — he's sending with his b.... left foot! The only way to teach these mutilators a lesson is to give 'em a dose of their own medicine".*

Whereby, he tore off his left shoe and sock and, leaping up onto the rig table, placed a big toe on the key (the cord being too short to put the key on the floor) and proceeded to send an even sloppier reply, finishing with "How'd ya copy?"

"Good," was the reply, "you did better than the first call. Have you changed keys?"

Does anyone have a close-up photograph of Frank? —VK4SS.

AR

RANDOM MORSE

John Wickham VK3KGP
194 Beach Road, Mordialloc, Vic. 3185

Here is a handy little program to help limited and/or novice licensees to brush up on their CW.

The program generates groups of 10 lines of five characters each, sounding each line in CW and displaying them on the computer monitor after being sent. The program-user copies each line as it is sent through the monitor speaker and after receiving all ten lines the result is compared with the displayed lines for correction purposes. *(So no cheating! !)*

After checking the results, any key except T is pressed for another set of 10 lines.

The speed setting is arbitrary as I do not know a suitable algorithm for speed entry in WPM.

It is not necessary to press *Return* after

```
10 DIML$(50),M$(36),XZ$(4)
20 REM
30 REM.-.-.-.-.-.-.-.-.-.-
40 REM
50 REM RANDOM MORSE
60 REM
70 REM.-.-.-.-.-.-.-.-.-.-
80 REM
90 POKE 36879,8:PRINT CHR$(5)
100 GOSUB 1360: GOSUB960:GOSUB250
110 PRINT"";:REM PRINT CLEAR SCREEN
120 GOSUB1170:FOR ZZ = 1 TO 5999: NEXT
130 FOR A = 1TO10
140 GOSUB 870
150 FOR B = 1 TO 5:S$=MID$(T$,B,1)
160 GOSUB380
170 FOR K=1TOL
180 L$=L$(K)
190 GOSUB 520:L$="":REM ANULLINL$
200 NEXTB:PRINTT$:PRINT:FOR ZZ= 1TO 2499:NEXT:NEXTA
210 GET UU$:IF UU$="" THEN 210
220 IF UU$="T"THEN PRINT"";:END
230 L$="":S$=""
240 GOTO 110
250 FOR I=1TO36
260 READ M$(I):NEXT
270 DATA".-","-...","-.-.","-..","."
280 DATA"..-.","--.","....","..",".---"
290 DATA"-.-","-...","--","-.","---"
310 DATA".--.","--.-","-.-","...","-"
320 DATA"..-","...-",".--","-..-","-.--"
330 DATA"--..","-----"
340 DATA".----","..---","...--"
350 DATA"....-","-....","--..."
360 DATA"---..","----.","....."
370 RETURN
380 REM
390 REM TRASLATION
400 REM
410 L=LEN(S$)
420 FOR I=1TOL
430 L$(I)=CHR$(32)
440 FOR J=1TO26
450 IF MID$(S$,I,1)<>CHR$(64+J) THEN 470
460 L$(I)=M$(J)
470 NEXT J
480 FOR J=27TO36
490 IF MID$(S$,I,1)<>CHR$(21+J) THEN 510
500 L$(I)=M$(J)
510 NEXT:NEXT
520 REM
530 REM AUDIO CHAR
540 REM
550 IF L$<>CHR$(32) THEN570
560 GOSUB820:GOTO640
570 W=LEN(L$)
580 FOR I=1TOW
590 X$=MID$(L$,I,1)
600 IF X$=CHR$(46) THEN GOSUB650
610 IF X$=CHR$(45) THEN GOSUB710
620 NEXT
630 GOSUB 770
640 RETURN
650 REM
660 REM GENERATE DOT
670 REM
680 FOR D=1TO5:POKE36878,15:NEXT
690 FOR D=1TO5:POKE36878,0:NEXT
700 RETURN
710 REM
720 REM GENERATE DASH
730 REM
740 FOR D=1TO3*S:POKE36878,15:NEXT
750 FOR D=1TO5:POKE36878,0:NEXT
760 RETURN
770 REM
780 REM END CHARACTER
790 REM
800 FOR D=1TO2*S:POKE54300,0:NEXT
810 RETURN
820 REM
830 REM END WORD
840 REM
850 FOR D=1TO6*S:POKE54300,0:NEXT
860 RETURN
870 REM
880 REM GENERATE 5 CHARACTER WORD
890 REM
900 XX$="ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789"
910 FOR XX=0TO4
920 XY=INT(36*RND(1))+1
930 XZ$(XX)=MID$(XX$,XY,1):NEXT
940 T$=XZ$(0)+XZ$(1)+XZ$(2)+XZ$(3)+XZ$(4)
950 RETURN
960 REM
970 REM DISPLAY AND GREETING
980 REM AND SELECT SPEED AND TONE
990 REM
1000 PRINT "     RANDOM MORSE   "
1010 PRINT "ADAPTED FROM A PROGRAM"
1020 PRINT "WRITTEN BY L.R.CARTER"
1030 PRINT "% E.HUZAN -------- BY"
1040 PRINT "                J.L.WICKHAM"
1050 PRINT "               VK3KGP"
1060 PRINT "SELECT SPEED (1 TO 5)":PRINT
1070 GET UU$:IF UU$=""THEN1070
1080 S=(40-(7*VAL(UU$)))
1090 ONVAL(UU$) GOTO 1110,1110,1110,11101110
1100 GOTO 1070
1110 PRINT" SELECT TONE (1 TO 5)"
1120 GET UU$:IFUU$="" THEN 1120
1130 POKE 54280,(245-(4*VAL(UU$)))
1140 ONVAL(UU$) GOTO 1160,1160,1160,11601160
1150 GOTO 1120
1160 RETURN
1170 REM
1180 REM
1190 REM TO THE RIGHT OF RANDOM
1200 REM DISPLAY WITH INSTRUCTIONS
1210 REM
1220 E=7778
1230 POKEE,18:POKEE+1,1:POKEE+2,14:POKEE+3,4
1240 POKEE+4,15:POKEE+5,13:E=7822
1250 POKEE,13:POKEE+1,15:POKEE+2,18
1260 POKEE+3,19:POKEE+4,5:E=7952
1270 POKEE,1:POKEE+1,14:POKEE+2,25:POKEE+4,11
1280 POKEE+5,5:POKEE+6,25:POKEE+8,20:POKEE+9,15:E=7996
1290 POKEE,3:POKEE+1,15:POKEE+2,14:POKEE+3,20:POKEE+4,9
1300 POKEE+5,14:POKEE+6,21:POKEE+7,5:POKEE+9,15:POKEE+10,18
1310 E=8042
1320 POKEE,39:POKEE+1,20:POKEE+2,39
1330 POKEE+4,20:POKEE+5,15:E=8085
1340 POKEE,20:POKEE+1,5:POKEE+2,18:POKEE+3,13:POKEE+4,9
1350 POKEE+5,14:POKEE+6,1:POKEE+7,20:POKEE+8,5:RETURN
1360 PRINT"TURN UP YOUR A.F.GAIN"
1370 FOR ZZ=1TO5999:NEXT
1380 PRINT"";:RETURN

READY.
```

entering the settings as the program responds on the knocker.

To end the program, press **T** without hitting *Return.*

This program was written for the Commodore VIC-20, but it should be easy to modify for the other computers. Checking the classified advertisements reveals plenty of VICs going for a song and I personally prefer these keyboards instead of rubbery keyboards frequently found on many economy computers.

The main heart of the program is not mine as it was written by L R Carter and E Huzan, and is found in their book "Learn Computer Programming With The Commodore VIC" on pages 125 to 127.

With this program, a word is entered, which is then sent back in CW via the monitor's speaker. I have merely added a subroutine at lines 8000 to 8999 which randomly generates a five character line consisting of either letters, numbers or both which I feel is of far more value to budding CW enthusiasts plus the means to check their results.

So give this program a try and tailor it to suit your own needs. *Happy brass pounding.*

EDITOR'S NOTE: Some of the special Commodore symbols have not printed on the copy of the program, however regular Commodore users will be able to work these out.

AR

AN OMNI-DIRECTIONAL 2 METRE VERTICAL

Ian Keenan VK3AYK
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Described is a unity gain vertical antenna for the 2 metre band.

The antenna is made out of RG-58 coaxial cable and enclosed in 25mm PVC conduit.

CONSTRUCTION

Using approximately 3.1 metres of RG-58 cable, carefully strip off 425mm of braid from one end (so inner is exposed). Then cut off about 200mm of the inner conductor and solder an identical length of braid to that just removed from inner.

Cut off 1.5 metres of 25mm PVC conduit, measure down 850mm and drill two 9mm holes 45mm apart. Feed the RG-58 through the upper hole (trimmed end) until it is flush with the top of the conduit. Form a nine turn coil with the other end of the cable around the conduit and pass it through the lower hole out the base of the conduit and then pass it through the lower hole and out the base of the conduit.

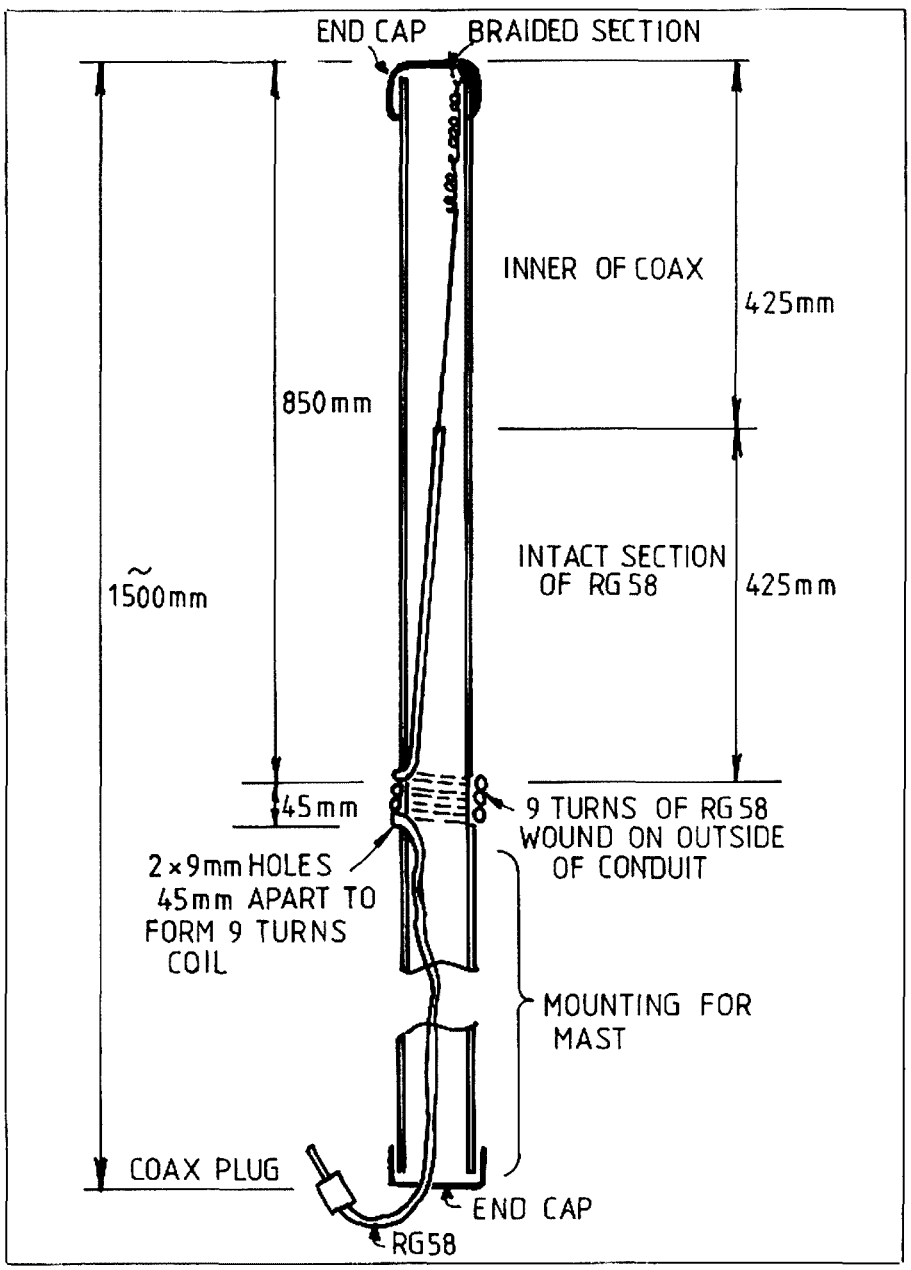
Temporarily tape the top of the aerial to the conduit and check the VSWR. This should be about 1.15:1 at 146 MHz rising to about 1.4:1 at either end of the band. Minor tuning can be effected by altering the length of the top section.

Having checked the tuning, pull the top section of the aerial tight and fold it over the end of the conduit (about 5mm over end) and slip a 25mm end cap over top. This will hold aerial reasonably tight inside. Drill a 9mm hole in another end cap, pass the coax through the cap and use it to plug the bottom of the conduit. Drill a small drain hole if required. Wrap the coaxial coil with good quality tape to hold it firm.

Care should be taken in the choice of conduit as some have varying amounts of carbon in their composition which can greatly alter tuning and performance. Conduit used in this model was 25mm class 12 (white) AS 1477/850511 manufactured by Hulmes Australia. This and the caps are available at plumbing outlets.

The antenna is a unity gain type (performance comparable to that of a dipole) but still gives good results. It is easy to make and can be built in about an hour. No originality is claimed for the electrical design, as it is based on commercial designs.

AR



CW PROGRAMMABLE MEMORY KEYERS

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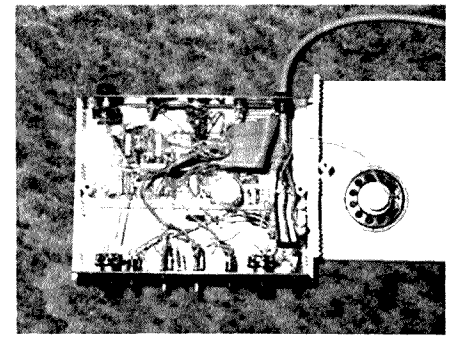


With low cost memory chips becoming readily available, it was decided to use them to take the hard work out of calling CQ on the new WARC bands. It was because of the interest of Lindsay VK5GZ, in activating these bands that prompted the writer to develop the following designs.

The static RAM chips used were the 2102L because of their ready availability and low price, even though it would have been nice to have used the CMOS variety which were in short supply at the time (and expensive). The other desirable features for the designs were:

The use of readily available parts.

The ability to key the transmitter either manually by key, or automatically via the keyer without disconnecting the key. Keying via the latter mode to continuously cycle via the memory, or memories, until stopped manually.

Enough memory time available so that a pause can be left at the end of the message to listen for any replies to the CQ call before the message/s restart. This allows the operator to take control of the transmitter if an answer is heard in the silent period.

The messages to be easily inserted and changed without the burning in of ROMs or programming of EPROMs. This flexibility was decided on even though it meant re-programming the keyer each time the power was disconnected.

Ability to be used as a code practice oscillator with, or without, using the memories.

Usable as a teaching aid to the newcomer trying to master the Morse code. This ability to record, then listen to the playback of one's effort is quite revealing. Any dits that are clipped, or poor spacing are quickly revealed to the operator.

A continuous speed adjustment from about three to 30 words per minute.

An audible (with volume and tone adjustment) as well as visual indication of the keying.

Switchable memories so that several messages can be recorded, stored, then selected as required.

Automatic cancelling of the write enable as the memory or memories become full so that over-writing of the message/s cannot occur. This also returns the keyer to the beginning of the recorded message/s. (Replay of the message then commences unless the HOLD *switch is operated).*

Recording to be able to be stopped, resumed, or cancelled during the record cycle.

Manual reset to the beginning of the message to be transmitted before or at any time during the transmit cycle.

The ability to stop, hold, then continue transmission at any time during the operation of the keyer without sending out a signal during the hold period. Transmission can then be resumed from the place from which it was stopped, or reset to the beginning of the memory originally selected, or to a new memory if a different message is desired.

The two memory keyer circuit to be easily converted to a single memory version if it is decided that one memory has enough capacity for normal CO calling, or activating a dead band.

EXTRA FEATURES OF THE FOUR MEMORY KEYER

Four memories of 1024 bits are used, each being controlled by a switch on the front panel. A memory distributor controls the use of the memories selected by four switches. Rotation is from memory one to memory four from left to right only, ie going from one to four and back to one etc, continuously until manually stopped. Those memories not required are bypassed until switched into use.

Any one, or more, of the memories can be used during a QSO so that each can be pre-programmed with, eg the CQ call, QTH details, type of rig, antenna, etc.

A binary display using five LEDs is used. A green LED (the reset) for 0 and four yellow LEDs 1 to 15 are used to give an indication of the remaining time left in each memory (good experience in reading binary!), a green LED also shows which memory is being accessed at the time. This system can easily be changed to a digital display if the builder desires to experiment, or it can be left out all together.

SIMPLE ONE OR TWO MEMORY CIRCUITS

This is ideally suited to the learner who requires a Morse code practice oscillator, and a means of generating and recording practice groups of characters to improve sending and receiving at different speeds. Memories can be used either singly or in series. The characters can be entered at a slow speed, and when confidence in receiving improves, they can be played back at a faster speed. Also it gives a chance to hear just how good one is sending. This allows for correction to be made and monitored.

The circuit is also very good as a CQ caller on dead bands (just ask Lindsay VK5GZ). It allows the operators to be doing other work in the shack at the same time as activating the bands. As soon as a reply is heard, manual operation is then resumed and a QSO, that may not have eventuated, may then be worked. (Some of the amateurs using these keyers are VKs 5NM, 5PH, 5NDR, 5BM, 5NBG and 6LC, as well as other VK, ZS and G operators who have been sent construction details).

(Lindsay has been using the two-memory version for nearly three-years. He can explain his operating system later).

By deleting the two switches (4 PDT), and one of the memories, plus a couple of resistors, a simple memory version can be built. This makes it easier and cheaper to build, but less flexible to use.

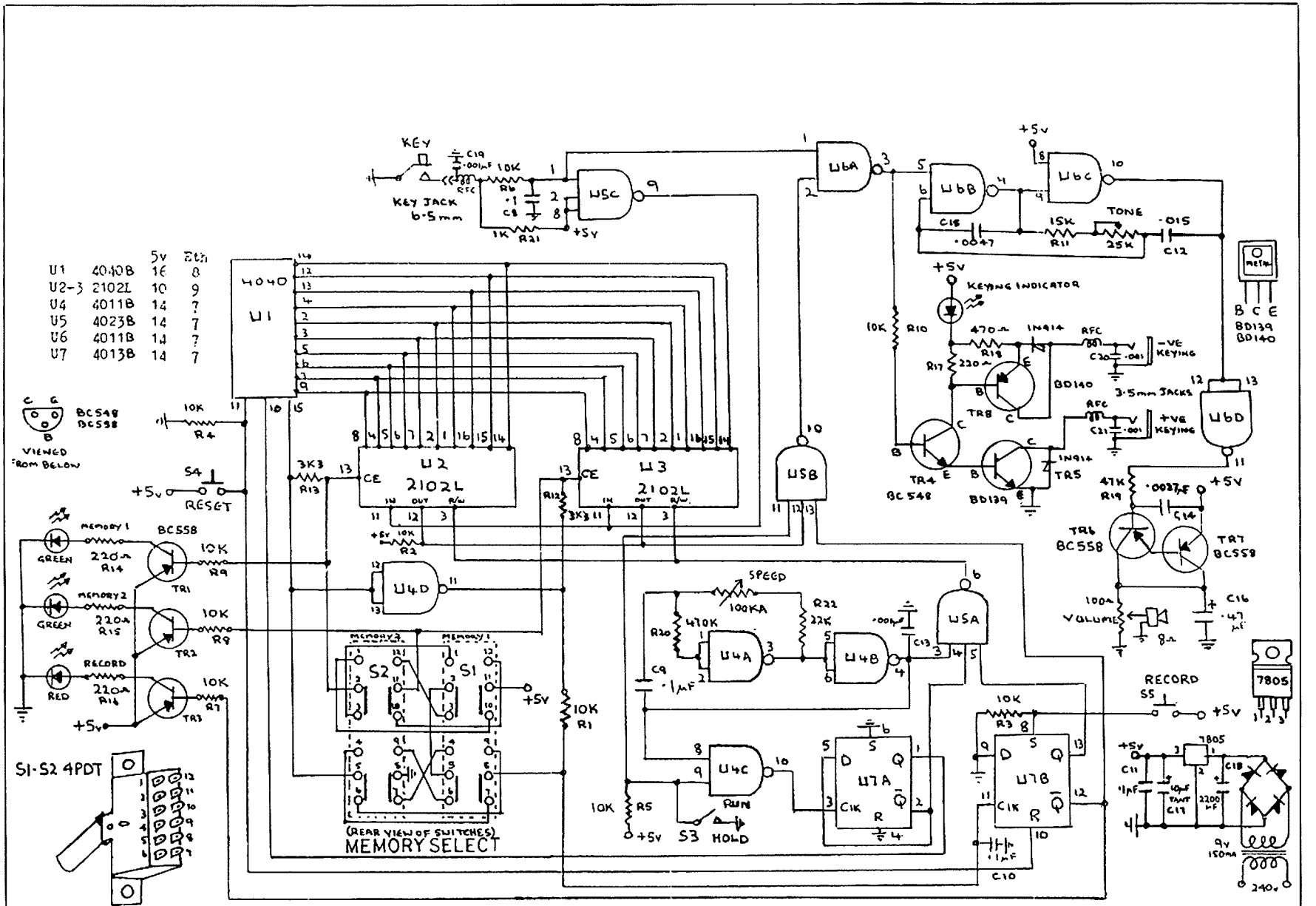
GENERAL CIRCUITRY FOR ONE/TWO MEMORY VERSION

The heart of the unit is the 2102L 1024 bit static RAM. The 4040B, a 12-stage ripple counter, is driven by clock pulses derived from a pair of NAND gates (U4A and B). These pulses have been through a D flip-flop (U7A) to even up their duty cycle (frequency is also halved). U4C is controlled by the *RUN/HOLD* key so that the clock pulses to the chips cease during the *HOLD* mode. When the *RESET* button is pressed all outputs of the 4040B go-low, and counting does not starts until the *RUN/HOLD* switch is in the *RUN* position. U5A and U7B control the *READ/WRITE* line to the 2102Ls. Pin 13 (Q) of U7B, a D flip-flop, goes high when the *RECORD* button is pressed. This allows data to be entered into the 2101L from the Morse key via U5C once S3 is in the *RUN* position. Outputs from the 4040B, in conjunction with the *READ/WRITE* pulses to the 2102Ls allow the storage of the data into the memories from the key via U5C and the *IN* pin 11 of the enabled 2102L. The polarities on the chip enable pins 13 (CE) of the 2102Ls to determine which one receives the data. The chip is enabled when pin 13 is low.

Initially, if both memories are to be used, pin 11 of U7B is high after the *RESET* button has been pressed. (Output from pin 15 of U1 to pins 12 and 13 of U4D is low and output to pin 11 of U7B is high as it follows pin 11 of U4D). It is not until pin 11 of U7B goes low then high again that the flip-flop U7B toggles holding pin 5 of U5A low. This prevents further recording. During the record period, the output of U4D goes low (after pin 15 of U1 goes high) disabling U2 and enabling (U3), the second 2102L. If only one memory is to be used then pin 11 of U7B will be low after *RESET* and U7B toggles the first time that its pin 11 goes high, ie it follows pin 15 of U1. (The two *MEMORY SELECT* switches take care of the difference between one or two memories as regards the correct chip to be enabled and the stopping of the recording at the right time). U5B ensures that during the *HOLD* condition no output to the keying transistors is obtained from pin 12 of the 2102Ls. (The hand key is still active if required). The spare gates in U6 are used as an audio oscillator to drive TR6/7 which amplify the keyed audio to the built-in 8 ohm speaker. LEDs indicate which memory is being used, when recording can take place, and when keying is in progress.

FOUR MEMORY KEYER

The general circuit is much the same except for the selection of the memories. The four memories can be used singly or up to four in series. They are controlled by the memory distributor circuitry consisting of U7A and B (one shot oscillator) U8A and B (dual D flip-flop), and U9 (quad 2 input NAND gates A-D). An extra green LED has been added to show when the keye



		5v	2th
U1	4040B	16	8
U2-3	2102L	10	9
U4	4011B	14	7
U5	4023B	14	7
U6	4011B	14	7
U7	4013B	14	7

Figure 1.

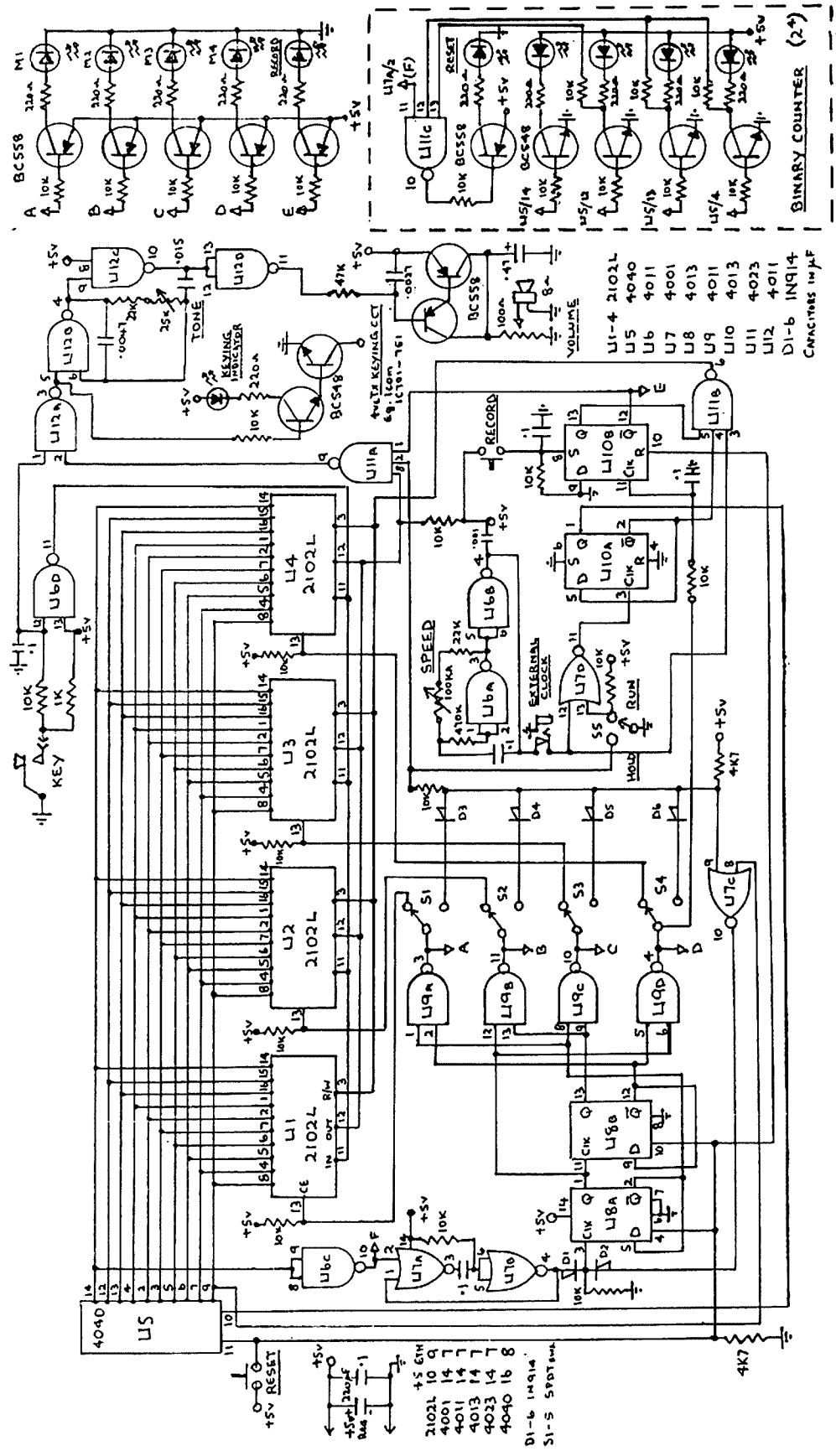

BINARY COUNTER (2⁴)
U1-4 2102L
U5 4040
U6 4011
U7 4001
U8 4013
U9 4011
U10 4013
U11 4023
U12 4011
D1-6 1N914
CAPACITORS IN µF
TONE
KEYING MONITOR
KEYING CCT
VOLUME
RECORD
SPEED
EXTERNAL CLOCK
RUN
HOLD
KEY
RESET
BCS58
BC548
4011
4001
4013
4023
4040
1N914

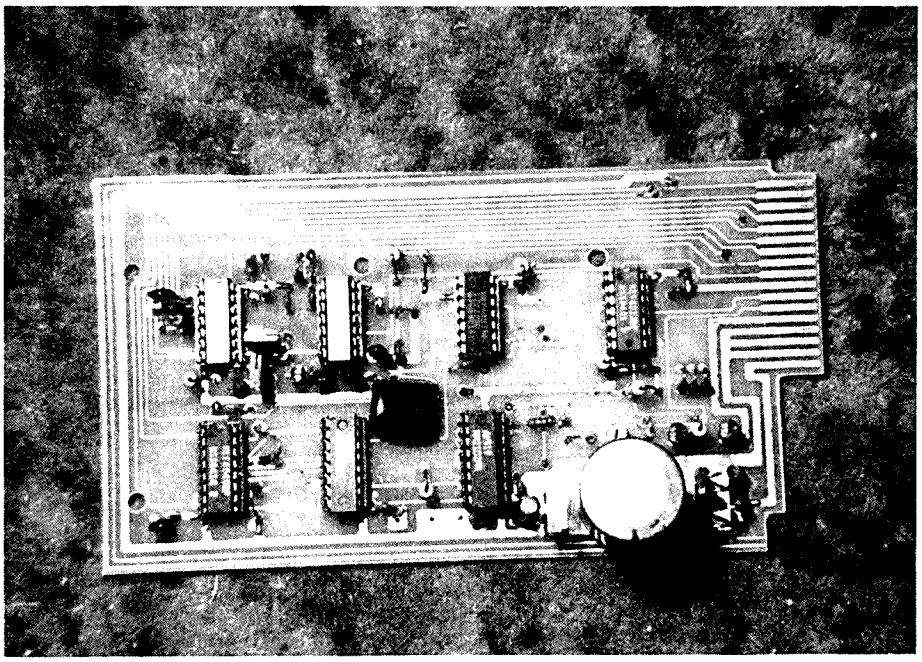
Figure 2.

has been reset plus the binary count orange LEDs.

CONSTRUCTION

All versions so far have been built up using vero board and IC sockets. (There have been enough faulty CMOS chips to warrant the extra expense of sockets, as well as simplifying initial point to point testing — a logic probe was invaluable for fault finding). The layout is not critical. The longest job is the commoning between the memories and the 4040B. There has been available, a commercial universal memory board from Tandy (part no 276-184). It could be cut in half giving two-four memory and one 4040B positions which cuts down the wiring time, especially with the four memory competition version. The single or two memory versions are not that hard to construct if Lindsay's vero board layouts and metal box templates are used. He will supply these, plus test-out details (if required). If you would like this information then please send him (QTHR) $2 for postage, photostating and packaging. Darryl VK5IN, has been organising the production of a commercial PCB that can be used for either the single or double memory versions. This should become available soon. (Because of the obvious advantages of a PCB, this article has not been published earlier). Please refer any queries to Lindsay regarding construction, parts, etc.

The only problems encountered over many prototypes has been with the values of the resistors R12 and R13 (nominally 4k7 in series with the chip enable pin 13). Due to differences in characteristics of the older type 2102 chips, it has been necessary to reduce these resistors to 3k3 and even 2K7 in some cases, for reliable operation.(On later trouble-shooting it has been discovered that it may be better to change the values of R8 and R9 from 10k to 27k, and reliable operation of the green LEDs driven by TR1 and TR2 is still OK even if R8 and R9 are 47k). A small capacitor C13 (0.001uF) from pin 4 of U4 to +5V or ground was added. This was necessary to cure what was thought to be a parasitic oscillation in some 4011B chips. RF feed-back was not found to be any problem even with the prototypes bread-boarded on the bench. Allowance has been made just in case. The RF chokes were made of 20-30 turns of fine wire, wound over a high value old style half-watt resistor and the units built in metal boxes. Some transceivers, eg FT707, had such low keying voltages that a protection diode in series with the transmitter keying lead to be omitted for satisfactory keying of the transmitter. The original keyers were built for operation with the Icom range of transceivers so a single BC548 easily handled the keying voltage and polarity. Since then, provision has been made for high voltage on the keying line, eg TS820S etc. Also, keying polarities varied so both the BD139 and BD140 (available from the SA Division ESC) were incorporated to cater for all



transceivers. The four PDT switches are DSE S-1301 and are best wired before installing, leaving the six flying leads to then be connected. The power supply can be either external or internal. The keyer can be built into quite a small space if required. My four memory version, including the power supply, fits into a metal box measuring 50 x 100 x 150mm. Two circuit boards were piggy-backed.

OPERATION (written by Lindsay VK5GZ)

By setting the memory speed control to its slowest speed, switch the *RUN/HOLD* switch to *HOLD*, then press the *RESET* button. This resets the memory to the beginning. Press the *RECORD* button to put it into the *RECORD* mode, the *RECORD LED* lights up. It is now ready for recording. Put the *RUN/HOLD* switch into *RUN* and commence sending Morse at a speed of five words-per-minute. It should hold about five words (during entry you will see the CW monitor LED blink as it follows the dots and dashes. An audio note — volume and tone adjustable — will also be heard). When the memory or memories are full the *RECORD* LED goes out. The memory switches itself back to the start and prevents over-writing. Cease sending. Playback of your recording will commence unless switched to *HOLD*. Replay can be sped up by advancing the speed control.

Now try and put in a normal CQ call. Advance the speed control to around one-third, then re-program the memory as above. Commence the sending at your normal operating speed. If you finish 10 seconds before the *RECORD* LED goes out, it means that the speed control can be advanced a little more. If the *RECORD* LED goes out and the replay commences to jam your sending before you have keyed in all of your message, it means that the speed control; must be eased back a little. After adjusting the memory speed control, repeat the above until you get it correct. Now try loading in a longer CQ call using the same speed. This entails the memory holding more information than your last CQ call, so the speed control must be eased back a little more, before commencing to send.

When operating at a normal operating speed of 15 WPM, I like to have about a three-second pause on listening before it commences another CQ call. I operate my receiver CW VI at about a speed of 7WPM. This saves the transmitter switching from transmit to receive all the time, also you do not hear all of the QRM on your own frequency. At fast operating speeds, it is bad enough thinking up the sentences to send, then sending it one word at a time, and transferring the Morse dots and dashes into twin paddle movements.

When you understand all of its operation, you can plug the output of this memory keyer into your transceiver. It is recommended to leave the key lead at its normal length (the memory may be out on loan) and make up a new shielded lead with a 3.5mm plug for the memory unit end, and a 6.5mm plug for the transmitter end.

Upon entering my shack, I switch on the power to my transmitter, the keyer, and the memory unit. After checking the speed setting of my paddle keyer, then the memory speed control, press the *RESET* and *RECORD* buttons, switch to *RUN*. then put out a live, on-air, CQ call while it is being recorded. It can now be slowed to 6WPM or advanced up to 30WPM. The VOX time is naturally lengthened or shortened, so beware! Every so often, switch to *HOLD* and listen, just in case you have missed a late caller, then go back to *RUN*. It will carry on sending where it left off.

During transmit operation, the audio of the memory can be turned down if it is preferred to listen to the receiver monitor. The contents of the memories can be changed at any time. Once the message has been recorded, make sure that the *RECORD* button is not pressed unless it is desired to change the contents of the memory.

AR

ELECTRONIC MAIL CATCHES ON

A high demand has resulted in Australia Post increasing its number of electronic mail centres by 25 percent.

The expansion will mean that 145 centres will be equipped to receive; transfer and deliver Intelpost.

Launched two years ago, Intelpost has the first public service of its kind which could transfer customers' documents across Australia, to 80 percent of the population, in two hours.

If the earth were a perfect conductor man-made currents flowing into it would meet no resistance.

AERIALS and EARTHS

John Gazard VK5JG
2 Corbin Road, Medindie Gardens, SA. 5081

Electrically the earth maybe considered as having a huge capacity. It is so large that man-made currents flowing into it do not raise its potential. If the earth were a perfect conductor, such current would meet no resistance. However, the earth is rather a poor conductor and so, before this huge capacity is reached currents must initially flow through a certain amount of resistance. After the initial earth contact, the cross section of the conducting path increases rapidly with distance, and after the first metre or so, the resistance becomes very small.

For example, if an earth stake of two centimetres diameter is driven one metre into the earth, the cross-section of the conducting path at the surface of the stake is 630 cm², but 10 cm away the cross-section is about 7500 cm² and one metre away it is over 188 000 cm². Thus, the resistance met by the currents entering the earth occurs close to the entry point and varies primarily as the surface area of the stake or other contact.

To find what earth resistance might be met in the loamy soil around Adelaide, two steel rods, 17 mm diameter and 1.25 metres long, were cleaned of scale and rust and pointed at one end. A cross-piece was welded to the other end to enable the rods to be twisted when withdrawing. They were driven into the earth to a depth of one metre and spaced five metres apart in various locations. The resistance between the stakes was measured, and it was assumed that half the resistance measured would be near the resistance of a single stake.

The measurements were made in the middle of a relatively dry winter when the ground was moist but not saturated. Results indicated that the earth resistance varied greatly from place to place. With this configuration, values of 50 ohms to six ohms were measured with a most common value of 30 ohms for this type of loamy soil.

Additionally, measurements taken in a mangrove swamp, below high water mark, gave a resistance of 2.5 ohms, and when the rods were immersed in sea water the resistance was 2.2 ohms.

A commonly used earth stake consists of a 20 mm (¾") galvanised water pipe driven 1.5 metres into the ground, and following the above tests, it is estimated that in most situations at least two of these would be required if an earth resistance of five ohms or less is to be achieved. It is therefore suggested that, when establishing an earth system, two such stakes be driven one metre apart in the desired location and the resistance between them be measured. This will give an idea of the resistance of each stake and enable the full earthing system to be planned.

Other methods of making earth contact are by means of buried plates, usually copper, or radial wires, but these are not as easy to install as stakes. A warning must be given of the corrosive effects when copper is buried in the ground. Unless special precautions are taken, the antenna earth will generally be in contact with the power earth, which is, in turn, connected to the water service. If this is so, a galvanic cell is formed between the copper and the galvanised water service and will result in the corrosion of the water pipes.

Water mains can be used as earth points, but the actual earth contact of the main may occur some distance away from the earth wire connection so that the pipe becomes a part of the aerial circuit and, as such, makes for an inefficient system.

The half-wave wire is a basic radio aerial, and the most usual type is a dipole, which is a centre fed exhibiting feed impedance depending upon its height above ground of approximately 70 ohms. If, with a vertical dipole, the lower quarter wave is removed and that side of the feeder is connected to earth, we have a monopole. Assuming perfect earth the feeder connected to earth meets zero resistance. Thus the impedance of the monopole is half that of the dipole, that is 35 ohms. Since the current flowing into the earth meets zero resistance, there is no loss of power. However, in practice, there is always some earth resistance so that, neglecting the resistance of the aerial wire, the impedance of the monopole is in fact 35 ohms, plus the earth resistance. If the earth resistance is , say 15 ohms, the total impedance will be 50 ohms. The power consumed in the 35 ohms produces radiation, but there is very little radiation from the power consumed in the earth resistance. The antenna efficiency in this case would be 35/50 or 70 percent. If the earth resistance were reduced to five ohms the efficiency would be 35/40 or 88 percent, only 0.5dB worse than for a perfect earth. If the monopole is shorter than a quarter wave length and resonated by series inductance, it will have an impedance of less than 35 ohms, and earth resistance losses will become more significant for such a shortened aerial.

GROUND PLANE

The ground plane aerial is a quarter wave vertical radiator which does not require direct earth connection and consequently has no earth resistance losses. In this case the earth connection is replaced by four quarter wave horizontal radials and the current flows via the four radials instead of the earth. Since currents in each pair of opposite radials are equal and opposite, radiation from the radials is therefore cancelled, so they have no radiation resistance. Their conductor resistance is small. Therefore, they act in the same way as an almost perfect earth. (The above would be strictly true if opposing radials were coincident in space. Since, in practice, they are separated by up to a half wavelength at their tips, it is only a good approximation. Ed).

The ground plane aerial has two advantages over the monopole. It has negligible *earth resistance* and in most situations can be placed well above ground level, clear of obstructions. The impedance as stated earlier will be the same as that of a monopole (35 ohms). There has been some disagreement about this actual value. The RSGB Handbook states that it is less than 20 ohms whilst the ARRL Handbook indicates it is about 30 ohms. (A series of articles by VK2BBF, AR August-October 1984, analyses theoretically the impedance as a function of height above ground. Considerable variation is possible. Ed). An approximate measurement can be made by measuring the SWR in a feedline of known impedance when feeding a ground plane. If a two metre model GP fed by a 50 ohm cable is constructed and trimmed to provide minimum SWR, it will be found to be approximately 1.4 (and thus the approximate impedance of the GP is 50/1.4 = 35 ohms).

As both pairs of opposite radials are doing the same job of cancelling radiation from currents fed into them, it is logical to assume that one pair could be removed. This has been confirmed by detaching one pair, resulting in little change in impedance or field strength. With only two radials there is no resemblance of a *plane* and there seems to be little reason why the term *ground plane* should have been chosen for this antenna configuration. Unfortunately, the idea that a plane is required has led to amateurs cutting a hole in the centre of a car roof for a two metre mobile antenna when a quarter wave clipped to the roof gutter might serve nearly as well. The car body has sufficient capacitance for its potential to vary only slightly at 144 MHz. It therefore acts as a reasonable earth and the aerial functions as a monopole. (However, such asymmetric locations for mobile antennas can distort radiation patterns from the desired low-angle omni-directional. Ed). The erection of a GP aerial for the lower frequencies will be simplified if the radials are sloped downward. If this is done, the currents in the radials will no longer cancel in the vertical direction, and there will be radiation from the vertical component of the current. The radials will then have some radiation resistance which will vary as the length of the vertical component — ie Sin A, is the depression angle of the radials below the horizontal. If the radials are bent down 90 degrees, the aerial becomes a vertical dipole which has an impedance of approximately 70 ohms. By moving the radials from horizontal to vertical the impedance increased from 35 to 70 ohms. In general, for radials at an angle A below the horizontal the impedance will be 35 + 35 sin A ohms. To match a 50 ohm feeder, 35 sin A should be 15 and sin A 15/35 — ie A = 26 degrees.

This calculation was checked by making a two metre GP aerial with two radials. It was fed through an SWR meter and a 50 ohm coaxial cable and was trimmed for minimum SWR. This measured 1.5, indicating an impedance of 33 ohms. The radials were then bent down progressively and the SWR was found to decrease until it reached a minimum of 1.05 at an angle of approximately 25 degrees. As the angle was further increased, the SWR rose until it was again 1.5 when the radials were vertical, forming a dipole with an impedance of 50 x 1.5 = 75 ohms.

This experiment supports the above theory and brings about a different concept of a GP. It can be considered as a vertical dipole in which the lower quarter wave is split into two (or four) conductors and these conductors are bent up to the horizontal in opposite directions to cancel their impedance. The same currents flow as before and the radials take the same part in the resonant circuit except that they have no radiation resistance and consume no power.

Viewing the GP aerial as a folded-up dipole, another way of matching the aerial to a 50 ohm feeder is suggested. When the feed point of a dipole is moved away from the centre, the impedance at the feed point is increased. When the radials of a GP are shortened and the vertical is lengthened by a similar amount, this has the effect of moving the feed point away from the centre and increases the impedance. This was investigated using a GP aerial for two metres with two horizontal radials and a vertical (adjustable for length) and fed by a 50 ohm coaxial cable. Initially the radials

were cut to 16 inches, instead of 20 inches, and power was applied. The vertical was adjusted for minimum SWR. With a vertical length of 24.5 inches, an SWR of 1.0 was measured at 147.700 MHz and 1.2 at 146.500 MHz. Apparently, a GP aerial can be matched in this way. To match a 50 ohm feeder the ratio of radial to vertical would be approximately 2:3.

METHODS OF MOUNTING A GP ANTENNA

The easiest way to install a GP aerial is to place it on a tilt-over pole such as described in AR March 1964. The tilting pole need only be six metres long and can be made from 75 x 75 mm timber. The fixed pole could be a three metre treated pine pole about 100 mm diameter set one metre in the ground. With these sizes, a winch will not be required to haul it up, especially if the bottom end is counter weighted. A pole of this type, erected at VK5JG, did not require guys even when carrying a 10 MHz GR The antenna itself can be made of aluminium tubing bolted to the top of the pole. As this is a low impedance point, no special insulation should be required. The vertical should be cut to the formula 468/fMHz feet. The two radials can be 14 or 16 SWG or stranded earth-wire. They can then be tied at the lower end via a connecting rope, to a fence or post at head height. To provide the required 26 degrees slope (which is not critical) the radials and tying ropes, when sloping from a height of six metres down to 1.5 metres, will have a length of 4.5/sin26pi9021, or about 11 metres. The antenna can then be adjusted for minimum SWR by adjusting the length of the radials at ground level. It is suggested that the radial lengths be cut up to 10 percent longer than the vertical and that they be looped back through an insulator to enable the lengths to be quickly adjustable without the need for cutting or extending them.

Considering the GP aerial as a *bent-up dipole,* it would seem that several of them could be mounted on a single pole using a single feeder (as can be done with multiple dipoles). An attempt was made to mount together three GP aerials for the new 10, 18 and 24 MHz bands. The three aerials were set up about 15 cm apart on top of a six metre tilt-over pole and they, and the three sets of radials, were connected to the common feeder. It was possible to adjust the 10 and 16 MHz aerials to a low SWR and good performance, the 24 MHz aerial could not be resonated. It was then shifted to another pole and separate feeder where it performed well and exhibited low SWR. It was then shifted back to the other pair, (without alteration) where it again would not load. It was again set up separately and adjusted, and the 18 MHz aerial was moved alongside it and connected to the same feeder. While the 18 MHz aerial worked perfectly the 24 MHz aerial again failed to perform. No logical reason can be suggested for this apart from the obvious interaction between the antennas.

Another method to provide a multi-band aerial which can be quickly adjusted for each band is now suggested. The Alcan Company make aluminium tubing in sizes which telescope together. Using this tubing it is possible to make a vertical that can easily and quickly be altered in length. If three telescoping tubes, each of 2.44 metres (8') long are used, the lengths can be adjusted to —

2.4 metres approximately for 28 MHz
2.8 metres approximately for 24 MHz
3.3 metres approximately for 21 MHz
4.0 metres approximately for 18 MHz
4.9 metres approximately for 14 MHz
7.0 metres approximately for 10 MHz

A saw cut at the upper end of the lower two, plus two stainless steel hose clamps will enable the tubes to be clamped at any of the above lengths. A pair of flexible wire radials, 7.3 metres long, fitted with a screw clip at the end can be adjusted to length by looping back through an end insulator. Extra clips will be required for 28 and 24 MHz. If this aerial is mounted on a six metre tilt-over pole needing no guys, it should be possible to change frequency in less than five minutes if the correct settings of the tube and radials are marked. Tube sizes suggested are 25.4 mm (1"), 22.23 mm (⅞") and 19.05 mm (¾").

The possibility of including a 7 MHz aerial in this set up was considered, and so a 7 MHz GP aerial was constructed. I had a 10 metre stout tilt-over pole available, fitted with a winch. Telescoping aluminium tubes of 28 and 25 mm diameter, forming an element 10.05 metres long, was bolted to the pole with the base six metres above ground and the top extending to six metres above the top of the pole to form the vertical. No guys were used. This has withstood strong winds so far, but it remains to be seen whether the top six metres of unsupported tubing will bend in a gale. It has proved very satisfactory for 7 MHz working and has an SWR of 1.1. Considered as a *bent-up dipole* it also works on 21 MHz. This has proved to be the case although it was a little short for 21 MHz and had an SWR of 1.9. By temporarily adding 0.4 metres to each radial, the SWR was brought below 1.5.

No doubt this 7 MHz GP could be made mechanically safe by the addition of guys, but the multi-band quick-change facility would be lost.

AR

A PORTABLE THREE-ELEMENT BEAM ANTENNA FOR TWO-METRES

George Cranby VK3GI
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The writers normal mobile two-metre operation is carried out from his car, which is fitted with a mounting cradle, cabling for an 80 watt linear and a rear mounted, removable five-eighth whip. If this car is out-of-service for any reason — it is 16 years old — he is immobile as his wife's small car must not be modified in any way!!

This started an idea for a portable, external aerial for stationary-mobile use. *And why not make a proper job of it, at the same time?* Thus was born the concept of the portable three-element beam antenna. When finished it took less than 10 minutes to assemble and erect.

The 4.75 metre high portable mast consists of three pieces, 1290mm long, of 19mm (¾") aluminium tubing, cut from a standard four metre length, and an 850mm long wooden extension to allow vertical operation. The construction is shown in Figure 1 and is simpler than it looks. The bottom end of section one was formed into a spike to grip the ground. Section two has a 120mm length of 16mm (⅝") aluminium tubing, an easy push-fit, inserted for 60mm and secured with two self-tapping screws. The protruding 60mm slides into the top of Section one. This is held in place, when assembling the mast, with another self- tapper. (Do not lose this screw when dismantling. Screw it back into Section one).

The joint between sections two and three is identical with the one just described. Sections two and three should be identically drilled, to be interchangeable; if they are not they should be clearly marked.

Section four is a piece of 16mm (⅝") dowelling — pick a good one and varnish it — one end of which has the remaining piece of 19mm tubing slipped over it for 60mm and permanently secured. At the other end of this short piece of tube insert a 120mm piece of 16mm tubing and fix. Its free end fits into the top of Section three; however, when drilling the lead hole for the assembly screw, make sure to leave a gap of 3mm to allow space for the three-way guy ring (Figure 5), which is made from suitable aluminium sheet offcut.

Attach three pieces of nylon clothes line, about 4.30 metres long, to the guy ring. Make a loop at the end of each line to hold them to the ground by tent pegs.

A mast clamp, Figure 2, to hold the boom of the beam to the mast is permanently attached to the top of Section four. It is made from a 45 x 80mm piece of some heavier (3mm) aluminium offcut. Make up the two semi-circular clips to hold the boom to the mast plate. The locating screw is tightened also during assembly.

The boom (Figure 4) is made from 16mm (⅝") aluminium tubing. 3-6mm (¼") clearance holes are drilled as indicated, for the three-elements, which are cut for 146MHz. Make sure that the holes are exactly in the same plane, otherwise your beam will look very unprofessional. The elements are kept in place by locking them with self-tapping screws at 90 degrees. Mark the centre of each element with a ring of paint, for easier assembly. On the boom itself, mark the point of attachment to the mast clamp in the same manner.

The gamma match arrangement and the connection of the feed-line are shown in Figure 3. The plastic section used is a 100mm piece of sliding cupboard door track. The gamma tube is easily pressed into one of the rails, which spring open and firmly to hold the tube. It was found that the SWR was affected by the length of the coaxial feed-line and some trial-and-error snipping was required to finally improve the tuning after setting the gamma match to optimum. Since the coaxial socket for the feed-line is permanently attached to the boom, a flexible connection, which can be detached from the gamma tube, is required. Again, do not lose the screw!

Although it may be difficult to obtain short lengths of the various tube sizes, fellow amateurs may be helpful. The actual construction of the gamma match, although fiddly, is not difficult.

GAMMA TUNE

To tune the gamma match, assemble the beam to Section four — good practice — join sections four and one and drive section one into the ground. Connect the feeder cable — about 5.50m — to the antenna and the transceiver and fire-up (on a totally unused frequency please). Climbing up and down a step-ladder, move the position of the metal clamp or the adjustable rod, one at a time, until the SWR meter gives a good match.

STEP-BY-STEP FIELD ERECTION PROCEDURE

Assemble mast.

Assemble director and driven element to boom.

Slide free end of boom through the mast plate clamps. Tighten first the clamps and then the locating screw Make sure that the beam is either in the same plane as the mast (vertical polarisation) or at 90 degrees to it (horizontal polarisation).

Assemble reflector to boom.

Connect flexible from coaxial socket to gamma tube.

Connect the feed-line.

Fix the ends of two of the guy lines to the ground with tent pegs, about 3.4 metres apart.

Gently push up the mast until the two lines are extended and the mast is reasonable vertical.

Holding on to the third guy line take it to the 120 degree position relative to the others and secure by a tent peg.

Correct the mast position to be properly vertical; push it about 20mm into the ground to stop it from turning with every gust of wind. You can rotate the beam by hand due to the free guy ring.

Connect the feed-line to the rig and start operating.

My wife made me a carry bag from canvas, 1400mm long and 80mm in diameter. It comfortably accommodates the whole antenna. Do not forget to put in a small screwdriver to tighten all the assembly screws; it has also been found handy to carry a few spare self-tapping screws and some extra tent pegs — they have a habit of disappearing in deep grass.

AR

QSP

WATCH YOUR SIDEBAND

It would appear that DOC Monitoring Stations are paying particular attention to amateur transmissions in the 80 metre *DX Window of 3.794 to 3.800 MHz*, as several amateurs have recently received warnings from DOC that their sidebands are *out-of-band*. Not knowing whether the dial readout indicated suppressed carrier or centre of sideband frequency is not an acceptable excuse.

Most commercial amateur transceiver readouts indicate suppressed carrier frequency, therefore any operation below 3.797 MHz has a very good chance of some LSB products being out-of-band and causing harmful interference to commercial services on 3.793.5 MHz. Excess power levels also will increase your chances of causing interference to commercial services on channels adjacent to the window.

Amateurs using the 80 metre *DX Window* are requested to be extremely careful of their operations and give a friendly word of warning to other operators who have strayed too close to the band edges. It would be a pity to lose this segment due to the carelessness or selfishness of a few operators.

STOLEN EQUIPMENT

Hal Wise VK2HW, has lost a Yaesu 209RH hand-held transceiver, serial number 5K190401. Anyone locating said transceiver or knowing where-abouts of same please contact your local Police Station or Balmain Police Department.

THIRD PARTY TRAFFIC

Information has been received from the Department of Communications regarding Third Party Traffic in Papua New Guinea.

The Department wrote to the PNG Post and Telecommunication Corporation seeking their views on the possibility of obtaining an agreement concerning Third Party Traffic by amateurs of Australia and PNG.

The PNG administration replied that it is not their policy to permit TPT in the amateur service except in special circumstances. In addition, their present licensing conditions and regulations prevent PNG entering into an international third party agreement with other countries.

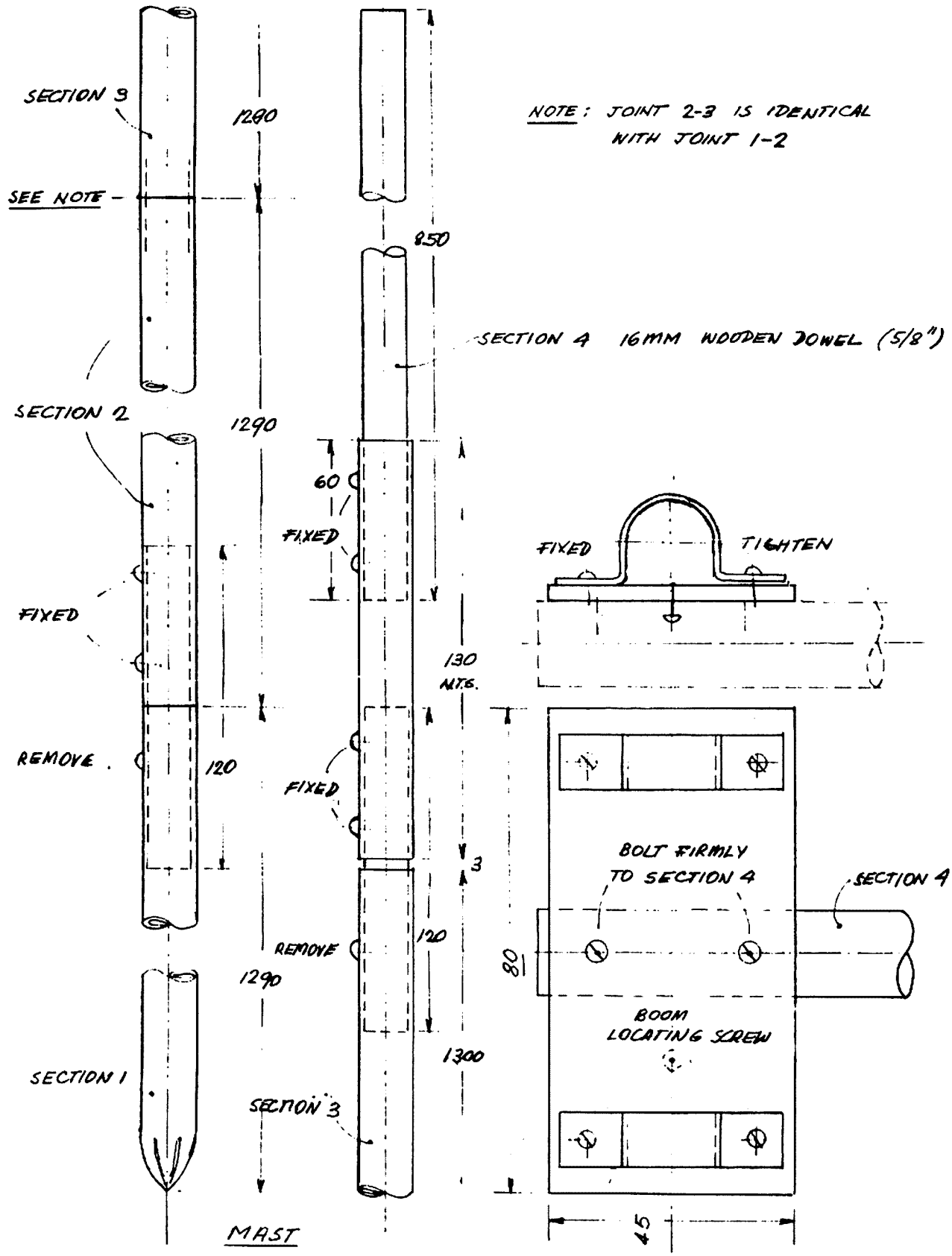


Figure 1 (Half Size).

Figure 2 — Boom Clamp Bracket (Full Size).

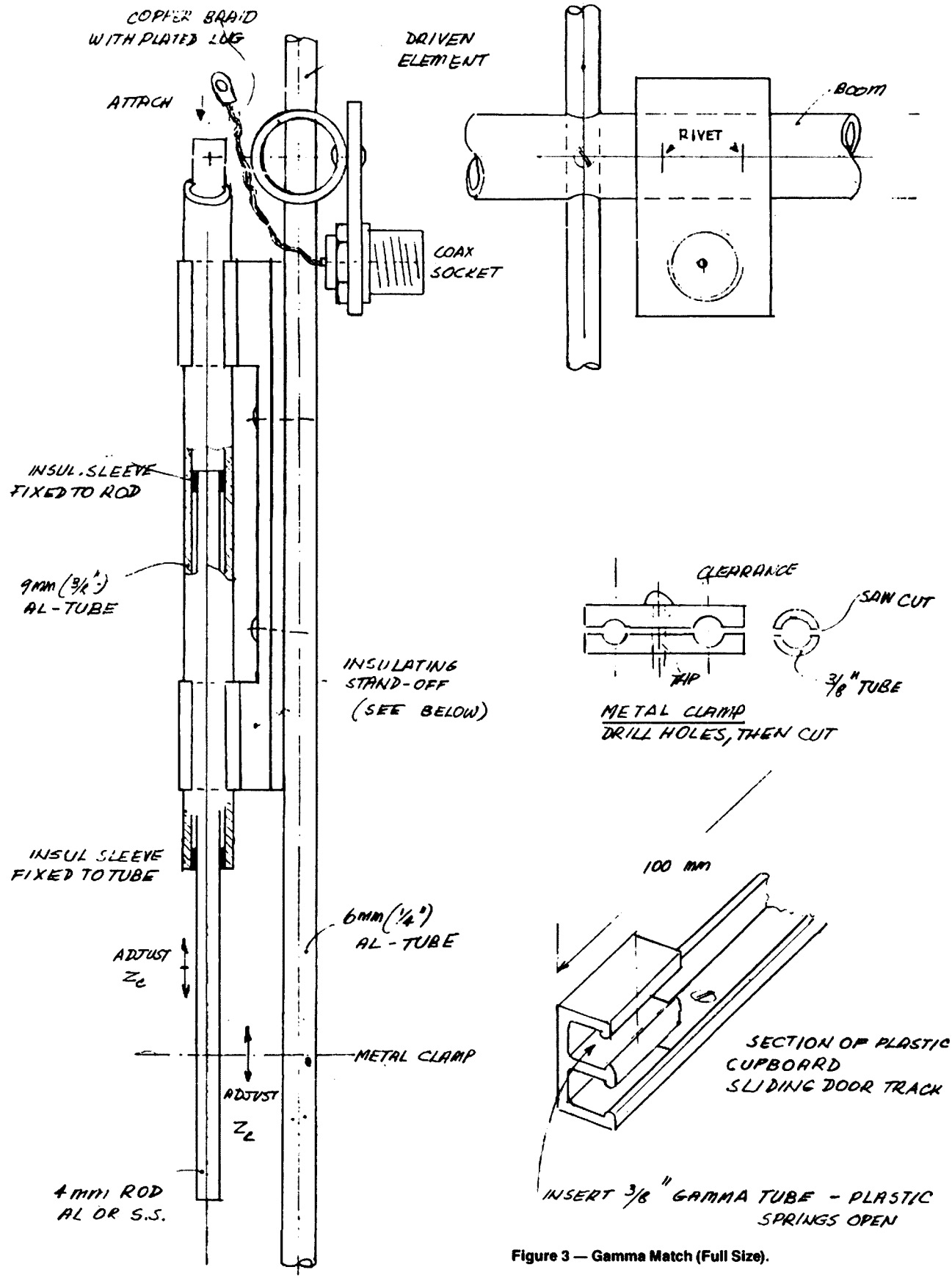


Figure 3 — Gamma Match (Full Size).

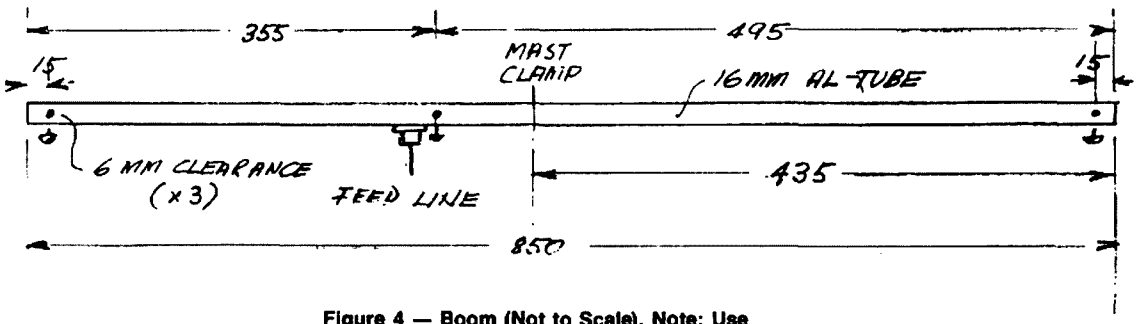


Figure 4 — Boom (Not to Scale). Note: Use locking screws for all elements.

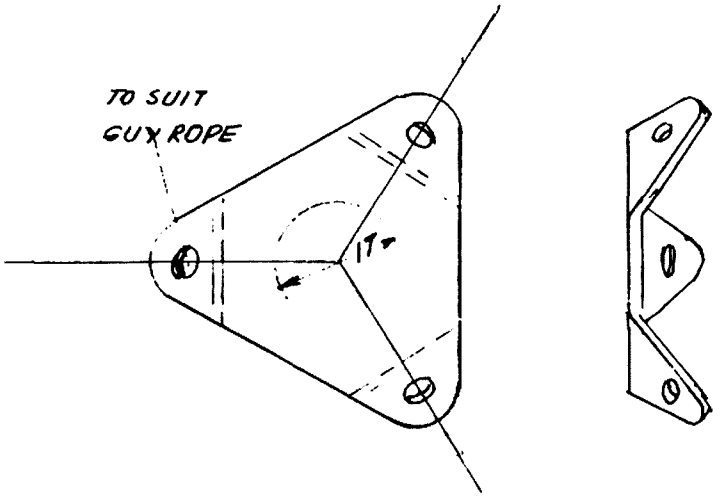


Figure 5 — Guy Ring (Full Size).

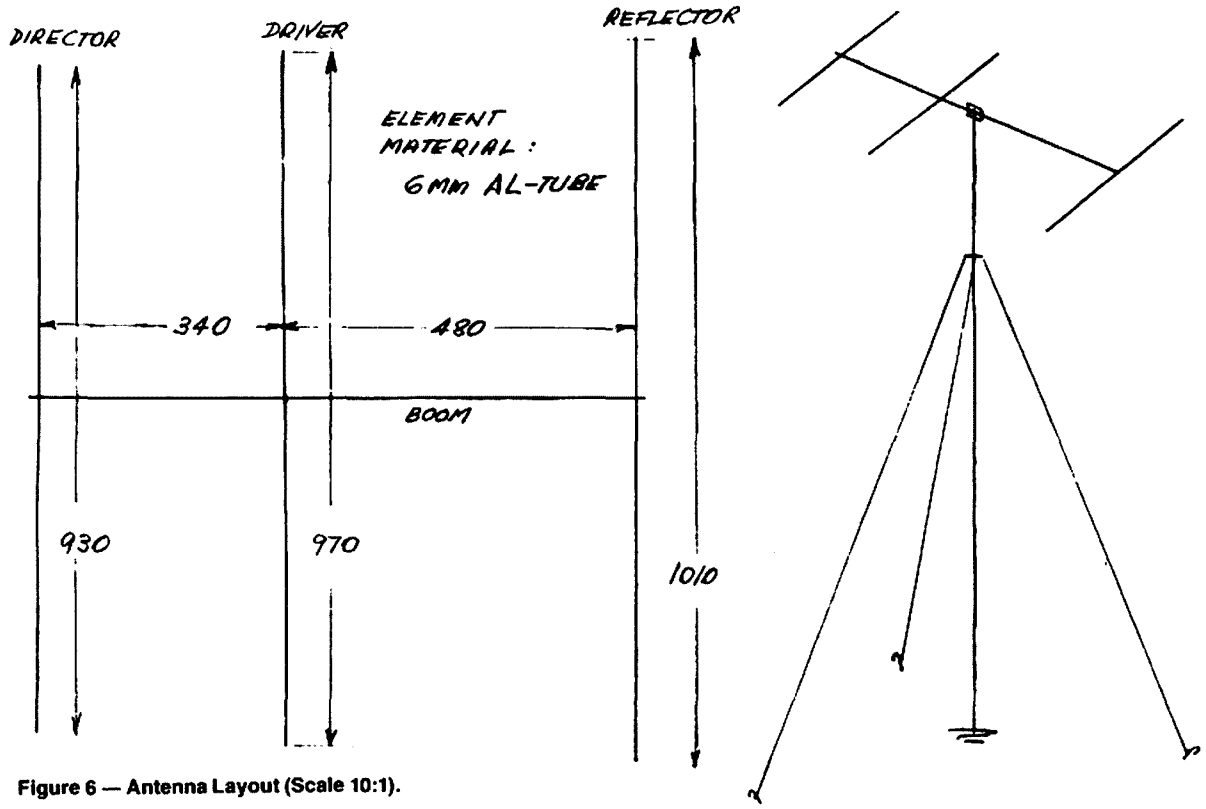


Figure 6 — Antenna Layout (Scale 10:1).

PLUMBING INTO ANTENNAS!

H Fietz VK7HH
72 Walter Street, Bridport, Tas. 7254

Whilst experimenting with a side-fed deita loop antenna, which was published in the second antenna book of RAA, the writer pondered about a connection which is not only removable, but also weather-proof.

I didn't have to think too hard, because my trusty *"plastic plumbers delight'* connection box, which has been used for a number of years, certainly came in handy.

Just a few small modifications were necessary on this occasion. The little gadget, which was constructed, is totally weather- proof, has plenty of room inside to accommodate a balun, as well as only being used for termination into coaxial cable. I have three in use at the moment and a couple more on the shelf.

My endfed wire antenna goes through one of these "pots" also and the banana plug is easily disconnected when a threatening thunderstorm is approaching. As I am so happy with this termination arrangement I thought it might entice some other amateurs to try this too. The costs are around $6 to $7 including the PL256 plug.

As the accompanying diagrams indicate, there is nothing really that needs explaining. It is simple and made in no time at all, even by people with two left-hands. It is necessary to use plenty of PVC glue around the cap to ensure no water can enter around the joint. It may also be a good idea to use some silicone rubber around the screws and lugs, but it must be of the non-acid type.

The ventilation hole in the disk is of importance for releasing air which expands when the sun is heating the "can".

AR

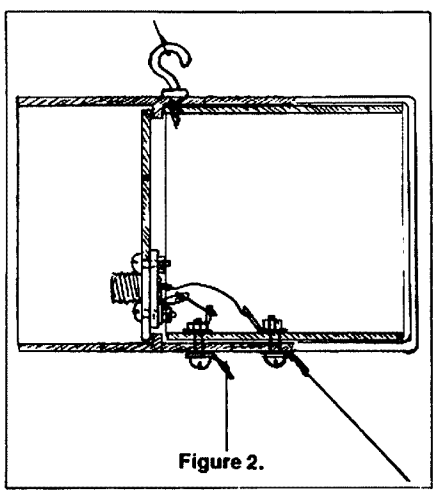


Figure 2.

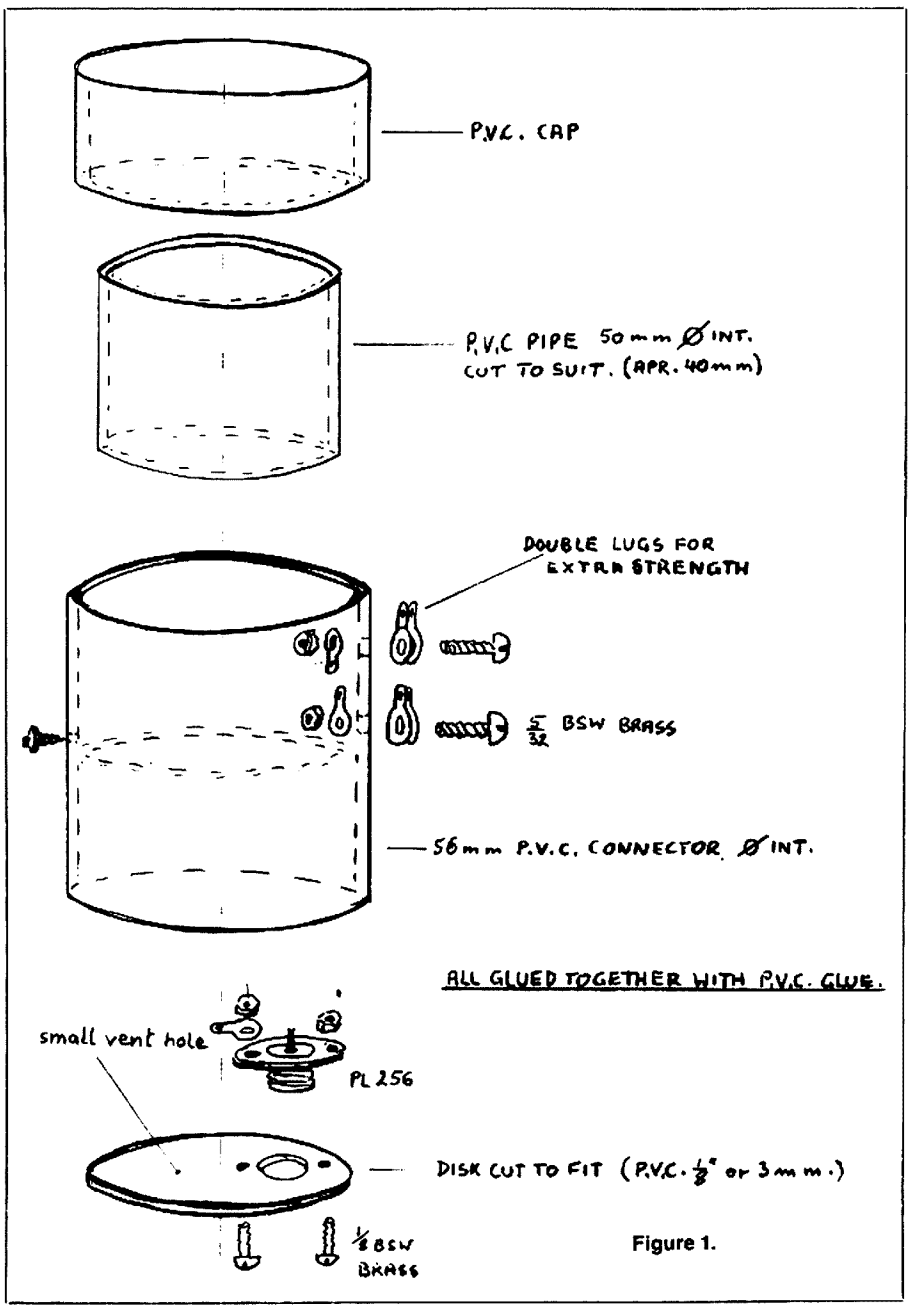


Figure 1.

QSP

UK WORKERS COMPUTE

By the end of the decade more than half of Britain's workforce will regularly use computer terminals.

Already, about 1.25 million Visual Display Units (VDUs) are already in use and sales of word-processors; personal computers and larger systems continues to grow.

ADDENDUM to Propagation via Reflections from Aircraft

Page 4, Column 3, last sentence before "Observations". '. . . even though this may BE the rest of an aeroplane'.

Page 4, Column 3, Observation 6, last part of third paragraph should read — '. . . is not clear whether or not turbulence is always reported when aircraft enhancement is poor, or whether or not aircraft enhancement is always poor when turbulence is reported'.

Page 5, Column 1, first full paragraph should read — 'In the case of Sydney stations although they are heard in Frankston earlier than AT VK3UMs, the time difference . . .'.

Page 5, Column 1, Observation d, third paragraph should read — 'In any case what exceptional lift conditions? Between Canberra and Melbourne? Sydney and Melbourne? Both? Or between Sydney and Canberra perhaps?'.

Page 5, Column 2, first line of text below Figure 1b, should read — 'In Figure 1b a REFRACTIVE layer of air . . .'.

Page 5, Column 3, Figure 1c — 'It isn't labelled!'.

Page 6, Column 1, first paragraph after Signal Strengths should read — '. . . his suggestion that SAY VK1BGs signal . . .'.

Page 7, Column 1, paragraph a after "Consider the following" should read — 'Obviously if the distances DECREASE the path loss will decrease'.

Page 4, Column 1, the formula for effective area of an isotopic antenna is — $\lambda^2/4\pi$.

RECEIVE RADIO-TELETYPE ON YOUR APPLE COMPUTER

David Armstrong VK3PNL/VK3XJP
PO Box 467, Portland, Vic. 3305

This program was especially designed for the Apple][Plus Computer however, it should work on any of the Apple][series of computers.

With a simple bit of software, a signal demodulator and an HF receiver, you can convert those funny warbling tones, so often heard on the amateur bands, to text on your Apple][computer screen.

The following program was designed for the Apple][plus computer, but should work on any of the Apple][series of computers. The program is written entirely in 6502 machine code, the Apple's native tongue, and will decode RTTY at the standard 45.45 Baud — but more about that later.

Before the computer can read the RTTY signal from your receiver, a piece of hardware known as a demodulator must be used to convert the audio tones from the receiver into TTL type 'logic' signals that the computer can understand. No construction details of such a device are given here but you shouldn't have any trouble locating one in various magazines and text books, that if you don't have, you may be able to beg, borrow or steal.

There is no need for a 'peripheral card' to be plugged into your Apple for this project. Instead, the power for the demodulator and the signal from the demodulator are connected to the standard Apple 'Game Control Port'. This is a 16 pin IC socket, located on the rear right-hand side of the mother-board. Connection to this is easily made with a 16 pin DIP 'Header' plug. Positive power Is available from pin one and negative is at pin eight. The signal from the demodulator is connected to the 'Push Button # 0' or 'PB0' of the game port and is pin two.

The program is written in 6502 machine code for an Apple][with a phase zero clock frequency of 1.023 MHz.

Pin two on the Apple game I/O connector is actually a one bit input port, which controls the logic level of bit seven at memory location $C061. If pin two of the same port is connected to ground, then bit seven of location $C061 will be at logic zero. If pin two of the game port is connected to +5V, then bit seven of location $C061 will be at logic one. Due to the nature of the TTL ICs, the inputs behave as if they are at logic one when they are left unconnected.

PROGRAM OPERATION

The program starts off by looking at memory location $C061, associated with pin two of the game port, until a start bit, logic zero, is detected. This starts off the following chain of events.

First, a register of the 6502 microprocessor, known as the Accumulator, is set up to act as both a counter and a store for the received teletype.

A delay of one half of the time taken for one data bit to be received, 11 mS in the case of 45.45 Baud, is then executed. After this, the received signal is in the middle of its start bit. A delay of the time taken for one data bit to be received, 22 mS in this case, is then executed, so as the received teletype is in the middle of its first data bit.

The logical value of this data bit (0 or 1) is then read and stored in the bottom end of the Accumulator, moving everything already in there one place to the left to make room.

A one bit time delay is then executed, to put the received teletype signal in the middle of its next data bit. The logical value of this data bit is then read-in exactly as before and the process continues until all five data bits have been read.

Once this is done, the Accumulator contains in its first five bits, a binary number between 0 and $1F hex. This value is then checked to see if it is a figures shift ($1B) or a letters shift ($1F). If it is a figures shift, then memory location $0803 is set to $20. If it is a letters shift, then memory location $0803 is set to $00.

Next, an index into a table of ASCII equivalent characters is calculated and the appropriate ASCII character is selected from the table and outputted to the computer's video screen.

The program then goes back to the start to look for another start bit and the whole process is repeated.

ENTERING THE PROGRAM

The program is entered with a machine code assembler, or from the Apple's machine code monitor program.

IN OPERATION

In use, a RTTY signal at 45.45 Baud must be tuned in on a fairly stable receiver with the capability of resolving Single Sideband (A3J). The receiver is generally set to Lower Sideband and the receiver is tuned until the demodulator 'locks- in' on the signal.

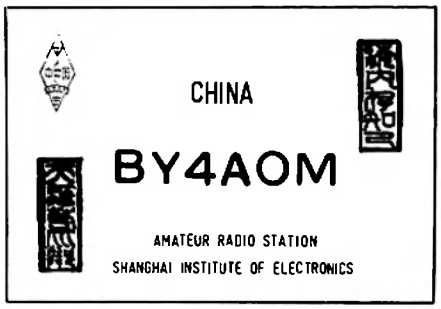
If garbage is printed out, shift to the other Sideband and re-tune the receiver, as the station may be transmitting an inverted signal. If there is still no success, you may be listening to a station using another Baud-rate, it may not be five bit RTTY, the message might be coded, or the station has a frequency shift unresolvable by your demodulator. Note also that noise, either from your receiver or your computer, can seriously affect the signal.

```
                        1  ********************
                        2  *APPLE ][+ RTTY (SV)*
                        3  *COPYRIGHT (C) 1985 *
                        4  *BY DAVID ARMSTRONG *
                        5  *  VK3PNL/VK3XJP   *
                        6  ********************
                        7
                        8  * GENERAL EQUATES
                        9
                       10  SIGINPUT  =  $0061     ;READ INPUT (PB0)
                       11  COUT      =  $FDED     ;OUTPUT CHARACTER
                       12
                       13             ORG $0800
                       14  *-------------------------
                       15  * 5 BIT INPUT THROUGH PB0
                       16  *-------------------------
0800: 4C 04 08 17      17             JMP START
0803: 00               18  SHIFT      IFB 00       ;INIT TO LTRS
0804: AD 61 C0 19      19  START      LDA SIGINPUT ;LOOK FOR START BIT
0807: 30 FB            20             BMI START
0809: A9 08            21             LDA #%00001000 ;SET UP COUNTER
080B: 20 3A 08 22      22             JSR DELAY2   ;TO CENTRE OF START BIT
080E: 20 3E 08 23      23             JSR DELAY1   ;TO CENTRE OF DATA BIT
0811: 2E 61 C0 24      24  RCV        ROL SIGINPUT ;DATA BIT INTO CARRY
0814: 2A               25             ROL          ;CARRY INTO A
0815: 20 3E 08 26      26             JSR DELAY1   ;TO CENTRE OF NEXT BIT
0818: 90 F7            27             BCC RCV      ;RPT TILL COUNTER OUT
                       28  *-------------------------
                       29  *CONVERT TO ASCII
                       30  *-------------------------
081A: C9 1B            31             CMP #$1B     ;IS BAUDOT FIGS?
081C: D0 05            32             BNE :1
081E: A0 20            33             LDY #$20     ;SET SHIFT FIGS
0820: 4C 29 08 34      34             JMP SSHIFT

0823: C9 1F            35  :1         CMP #$1F     ;IS BAUDOT LTRS?
0825: D0 05            36             BNE :2
0827: A0 00            37             LDY #$00     ;SET SHIFT LTRS
0829: 8C 03 08 38      38  SSHIFT     STY SHIFT
082C: 18               39  :2         CLC
082D: 6D 03 08 40      40             ADC SHIFT    ;CALCULATE INDEX
0830: A8               41             TAY
0831: B9 49 08 42      42             LDA ATAB,Y   ;ASCII EQUIV INTO A
0834: 20 ED FD 43      43             JSR COUT     ;OUTPUT CHAR TO VDU
0837: 4C 04 08 44      44             JMP START    ;GO BACK TO START
                       45  *-------------------------
                       46  *TIME DELAYS
                       47  *-------------------------
083A: A0 0A            48  DELAY2     LDY #$0A     ;DO 10 TIMES
083C: D0 02            49             BNE MSCNT
083E: A0 14            50  DELAY1     LDY #$14     ;DO 20 TIMES
0840: A2 D1            51  MSCNT      LDX #$D6     ;COUNT TO 214 FOR 45 BAUD
0842: CA               52  :3         DEX
0843: D0 FD            53             BNE :3
0845: 88               54             DEY
0846: D0 F8            55             BNE MSCNT
0848: 60               56             RTS
                       57  *-------------------------
                       58  *ASCII LOOKUP TABLE
                       59  *-------------------------
0849: 80 D4 8D 60      60  ATAB       HEX 80D48D6F A0C8CED6 A0CDD2C7 C9D0C3D6 C5DAC4
084C: CF A0 C8 CE CD 8A CC D2
0854: C7 C9 D0 C3 D8 C5 DA C4
085C: C2 D3 D9 C5 D8 C1 C7 CA 80 D5 D1
085F: 06 D8 C1 D7 CA 80 D5 D1
086F: AC AE 8A 62      62             HEX ACAE8AA9 BAC0B8E0 BAB0E3AB A4BFA7B5 A5AFAD
0872: A9 BA C0 B8 B0 BA ED B3
087A: AB A4 BF A7 B6 A5 AF AD
0882: B2 87 80 63      63             HEX B2878087 B1A880
0885: B7 B1 A8 80
```

INTRODUCING BY4 ***ABLE OLD MEN***

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131



A unique club station BY4AOM is on-air from Shanghai — to be club members you have to be an old-timer.

Each member held an amateur licence in the years prior to 1949 and some of the old boys were active in the mid-1920s with the prefix XU, which later changed to the prefix C.

The Chinese Government, under the then chairmanship of Mao Tse-Tung prohibited amateur radio in 1949, and the hobby has only been permitted in recent years through club stations.

Thanks go to Chief Operator of BY4AOM, 66-year-old Cieh Di-hau (John), ex C1TH, who supplied the details for this article.

The average age of the club members is 64-years, and in their first five months on-air they have worked five continents and 34 countries in about 800 contacts.

There are about 30 old timers in Shanghai, but some are too old and in poor health to operate BY4AOM, whilst others are still working and are too busy to enjoy amateur radio, but about ten old boys come to the station once-a-week, usually on Sunday afternoons.

John explained that about 40 VK contacts had been made, including one with Bill VK4WC, who has been in the hobby for more than 40 years. Bill asked BY4AOM to pass some QSPs to Mr Feng C1KF, who Bill remembered working in the 1940s. The request was passed on to Feng, now in his 70s, and he was most pleased to know that he was remembered by his fellow amateur radio friend.

John, ex-C1TH.

John reflected that there is no doubt that the hobby of amateur radio is not only a highly technical past-time but its activities promote the friendship and understanding between people of different nationalities and beliefs.

The BY4AOM QSL card has two lines of ancient Chinese script. One means *Within four seas there are bosom friends* and the other *People in the remotest corners of the world are neighbours.* How fitting to have this touch of age-old Chinese culture on the QSL card.

The stations main rig is a TR7 100W transceiver. Club members have home-brewed a two element four band (20, 15, 10 and 6 metre) boomless cubical quad antenna and rotator.

BY4AOM members — C1TH; C1HT; C1TH XYL; XU8EC; C1MK; C1SP; C1HY; C1CH; C1GC and C1ZZ. XU8WM was absent when the photograph was taken.

The antenna is mounted on top of a four storey building at the Shanghai Institute of Electronics and is about 25 metres above ground. It is fed with 300 ohm television ribbon, which goes into the transceiver via a home-brew transmatch and SWR meter.

The Club has plans to open a class to train high school boys and girls aged around 15-years to become radio amateurs. John said that the old boys plan to get amateur radio started in some of the universities and colleges in Shanghai.

BY4AOM's Chief Secretary, Tang Zung-ye (Tom), ex XU8WM, said he would welcome any technical books or magazines for the Club's library and youth training project. Their postal address is PO Box 227, Shanghai, China.

AR

JOHN MOYLE CONTEST 1986

During the 1986 John Moyle Memorial Field Day Contest, Gil Griffith VK3CGG ventured to the Mount Buffalo Chalet, at an altitude of 4500 feet, to operate and participate in the Contest. Gil's forte was Section B, transmitting in Morse. This was his third entry in a contest since obtaining his AOCP in December 1984.

Conditions were too windy to erect a 160/80 metre vertical, but an 80 metre dipole with a tuner worked well on all bands, except 160 metres.

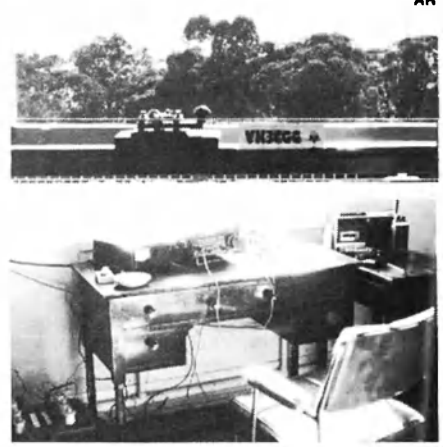
Eighty contacts were made, but the lack of numbers in Class B was quite disappointing.

Gil used a 90 amp/hours battery which was on-charge (1 amp) all day on the Saturday and Sunday, and the battery was down to 11.5 volts under full load (20 amps), however, most of the time it was only using 700 mA on receive and 9 amps on transmit with 20 watts output. He operated from 0600 UTC Saturday to 0600 UTC Sunday, with four hours off for a nap and some breakfast, when the bands were quiet.

The Chalet Manager, Mr Michal Alstin, was most co-operative with the whole exercise and has also kindly provided Gil with some postcards, which he will be using as QSL cards.

AR

Mount Buffalo Chalet.



The Operating Positions.

OPERATING IN IRAQ

This article began in early 1984, when Ray VK5DI began corresponding with Saad YI1BGD, to confirm that individual licences had been issued in Iraq. Amateur radio history in Iraq was rather sketchy and Saad, and others intended using Ray's call sign, YI2FD, as a precedent in an attempt to have individual licences issued again. Ray used ex-military equipment whilst operating YI2FD during 1952-53, and during his stay in Iraq, witnessed one of the other amateurs worked WAS in 48 hours (48 States in those days). In early 1984, Lajos HA5DW, spent some time in Iraq assisting the radio club install equipment and antennas.

In early January 1984, Lajos HA5DW landed at Baghdad's modern airport. Lajos was a member of an eight-man crew from a Hungarian company. Over a period, Lajos had worked many operators through the Iraqi Club Station, YI1BGD, and was now eager to meet with these operators.

The first meeting was with Majid Abdul Hameed, a founding member of the Club and a pioneer in Iraqi amateur radio. On the way to the radio station, Majid explained that in the capital city's two Institutes there are 60 different special spheres of interest — amateur radio is one of these interests.

After great efforts, the amateur group began in the 1970s, but few knew what this hobby was all about. The station was heard on the 20 metre band using a donated Atlas 210 and a home-brew two-element quad antenna.

Upon arriving at the radio station, Lajos was amazed at the comfortable, well furnished radio room, complete with Drake equipment (a donation from King Hussein JY1). The station had a Drake 2kW linear and Yagi, donated by the NCDXF, for the upper bands.

During the afternoon, Lajos was invited to use the station and was pleased to work many Hungarian stations and was hence-forth able to pass news of his well-being to his family at home.

From left: Majid, Kamal, Arshad and Saad, operators at YI1BGD.

In the evening, Lajos presented Majid with Morse cassettes and an amateur atlas of antenna designs and Majid discussed his future plans for the station and for amateur radio in Iraq. Majid hoped to attain call signs *from* YI1-8 *according to the* eight provinces, YI9 for visitors and YI0 for special stations.

The group made wire antennas for the lower bands and a delta loop frame, ready to mount on the mast, for 40 metres, the biggest problem was to locate a mast. Finally one was acquired in a most unusual way. A Hungarian team of mechanics were invited to a "Goulash Party" to celebrate the completion of the installation of

IRAQ
DIRECTORATE GENERAL OF POSTS
& TELEGRAPHS

No. ~~2346~~. 60/60/ 26566
Baghdad, dated the 28 August, 1952.

To:-
Mr. Robert George Raymond Dobson,
British Royal Air Force,
HABBANIYA.

Amatur Transmitting Licence

Reference your application dated 9/5/1952.

I enclose herewith an amatuur transmitting licence for the period of one year from 1/8/52 upto 31/7/53 .

Will you please acknowledge receipt.

ACTING DIRECTOR GENERAL OF POSTS & TELEGRAPHS
IRAQ.

Ray's YI licence.

Amateur Radio Station

Yi2FD

Ray's QSL card.

an air-conditioning plant a month ahead of schedule.

After a week of amateur activities, Lajos spent a day of exploring the ancient Mesopotamian culture of Ninive, Samarra, Hatra and of course Babylon. Further time was spent writing QSL cards and summarising a list of HA stations worked. During the course of the evening, Lajos explained the problems he was encountering in trying to locate a suitable mast. Next morning a truck arrived complete with five telescoping masts.

Eventually all equipment and antennas were installed, and tested. Lajos called CQ on 10 metres and within minutes had logged several stations. During one contact with an HA station, Lajos was informed that Spring had arrived in Hungary which made him feel very homesick as he was experiencing temperatures in the 40sC, much hotter than what he was used to in Europe.

During the visit to Iraq, Saad told Lajos of one of the first amateurs in Iraq, King Ghazi. In 1937-38, he operated a broadcasting station until his untimely death in a car accident in 1939. Saad also told of Ray VK5DI/YI2FD.

Finally, Lajos' contract had expired and it was time to return to Hungary. Goodbyes were said with the hope of meeting again, even if only through the air-waves.

Compiled from information supplied by Lajos Lewis Nagyvati HA5DW, Saad YI1BGD and Ray Dobson VK5DI/G3JDD (ex YI2FD and SU1FD).

Lajos at home in Hungary.

QSP

DEFENCE GOES DIGITAL

Australia's armed *forces are* upgrading their communications for the 21st century. The local telecommunications industry has negotiated defence contracts valued at $575 million.

Projects include a common users message-switched network, and a digital secure voice, data, facsimile and telegraph system. Advanced microprocessor controlled manpack and vehicle radios will also be introduced.

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.020	JA6YBR	*Japan*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Japan*
51.020	ZL1UHF	*Mount Climie*
52.013	P29BPL	*Loloata Island*
52.020	FK8KAB	*Noumea*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.370	VK7RST	*Hobart*
52.410	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*[1]
52.490	ZL3SIX	*Blenheim*
52.510	ZL2MHF	*Upper Hutt*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.465	VK6RTW	*Albany*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*[2]
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

(1) & (2) According to a note in the West Australian VHF Group Bulletin, *February 1986, from Bob VK6KRC, Peter VK8ZLX has commissioned a pair of VHF beacons at his work QTH in Alice Springs. The six metre beacon is operating on 52.485 MHz with 12 watts output to a half-wave vertical antenna. The two metre beacon is on 144.485 MHz and runs 10 watts into a quarter-wave whip. The present location is temporary, and Peter hoped to re-locate them at West Gap early in March, at 900 metres above-sea-level, with stacked cross dipoles on both bands.*

The identification sequence is repeated three times-per-minute: CARRIER — VK8RAS — ALICE — CARRIER —

Peter is keen to work two metres into Perth so, hopefully, this will become an accomplishment in due course and the beacon should aid any attempts.

1296 MHz FROM GERALDTON

Also from the same VK6 VHF Bulletin came the news that, on 3rd February 1986, what is believed to be the first 1296 MHz contact between Geraldton and Perth took place, over a distance of nearly 400 km, at 1157 UTC.

Bob VK6ZFY, operated portable from a location 7 km north of Geraldton and contacted Phil VK6ZKO, portable at Woodmans Point, Coogee, firstly on 70 cm at 1146. The change was made to 1296 MHz and signal reports were exchanged each way at 5x7.

Both stations used a TS700A, feeding a 23 cm transverter, each to a 28 element loop Yagi, VK6ZFY used two watts output, VK6ZKO had seven watts output. Congratulations! Both operators hope this contact will lead to others taking more interest in the 23 cm band.

MOUNT ISA JOTTINGS

Steve VK4KHQ, writes from Mount Isa; *"I enjoy reading your column in AR as it is interesting to see what we are missing out on!*

"A recent exception was on 2nd January 1986 from 0150 to 0200 UTC when I heard VK4KD calling on the Gold Coast Repeater, which also accessed VK4RMI here in Mount Isa. Although I heard strong, but intermittent snatches of the QSO, no QSO was made. Maybe next time.

"Also, the more I read about aircraft enhancement experiments, the more seriously I consider Mount Isa's position with relation to international flight paths and schedules to form a reliable monitoring pattern.

"With regard to six metre propagation, the 27 MHz CB band provides saturation coverage of VK and regular listening gives reliable indications of short skip conditions. Sometimes 15 metres is dead while the CB band is roaring with QRM proving where the MUF really is. Those scanning 15 metres declare the band dead!"

Thanks for your letter Steve. You are out on the proverbial limb to some extent in Mount Isa, particularly for two metres, but keep in mind the domestic FM band, 88-108 MHz, as a starting point for a rising MUF, and December 1986 should be another good year for long distance, two metre contacts, just like 1985.

END OF AN ERA IN DARWIN

A final letter has come from Graham VK8GB, indicating he was leaving Darwin on 26th February 1986, for a short holiday in Singapore and Hong Kong and then it was down to Canberra to commence work in his new position on 18th March 1986. He included confirmation of QSLs from VK9ZB and VK9LC and hopefully with confirmation soon to come for ZM8OY will mean his six metre final tally from Darwin would be 42 countries.

That's a great effort and indicates, despite our somewhat unfavourable position on the globe, compared with the Northern Hemisphere, which means often more kilometres to be covered for a contact, Graham nevertheless has shown that from a position in Darwin, probably more favourably situated in many ways than southern areas, has, through his own vigilance and dedication, topped the Australian list for countries worked and confirmed on six metres. Congratulations! In the July 1986 issue of AR, I will tell you what countries Graham has worked, the first contact being on 11th October 1977 and the last on 29th December 1985.

Naturally, Graham is going to find an entirely new ball game while in Canberra, but I am sure he will be making his presence felt. Opportunities will exist for him to add to his two metre tally, as well as operation on the higher VHF and UHF bands. Wherever you operate Graham, we all certainly wish you well and thank you for putting Australia on the VHF map of the world, firstly on six metres for such a great countries score, and secondly for so many contacts into Japan on two metres. But that band to Japan from Canberra might be harder!

SIX METRES IN THE UK

From 1st February 1986, all Class A licensees in the United Kingdom gained access to the six metre band between 50.000 and 50.500 MHz. (See full report page 3, February AR). Some restrictions have been placed on the power and antenna used, also, depending on where the amateurs live, there will be some restrictions, but operating time limits have not been imposed. All this is possibly for an interim period while the authorities study the impact of the opening of the band, particularly as it applies to possible interference in other countries of Europe still using the six metre area for other services.

Some of the limitations imposed make interesting reading. The power limit is restricted to 25 watts on CW and FM, and 100 watts PEP for AM and SSB, and this is ERP, or effective radiated power. Thus antenna gain and feed line losses need to be considered. Antennas are to be horizontally polarised and no higher than 20 metres. No mobile or portable operation is permitted, so no field days from hilltops! Considering power and antenna limitations, it would seem most stations will be operating in the 10 to 25 watts region, which will still be quite adequate for a lot of contacts, even as far away as the USA.

High power stations on the European channel 2 have 100 kW in Germany, Norway and Sweden, with the closest station being a low power device in Antwerp, Belgium, which fortunately, is vertically polarised, thus reducing interference from the amateurs. Effective beam antennas, directed towards th USA, should help keep interference to Continental television stations to a minimum and thus ensure continued use of the 50 MHz band for our UK friends. It would be great to have them still operating when the next solar peak comes along, probably about 1990. Let us hope too, that our own house can be put in order before that time comes; it was a most depressing situation for VK amateurs to have to sit by and listen to some exotic overseas stations on 50 MHz while we were limited to 52 MHz. Having, to a large extent, missed out on one of the greatest and widespread solar peaks of our time, we can only hope common sense will prevail to allow us careful usage of 50 MHz for the next time around.

ANTENNA STACKING

From *The West Australian VHF Group Bulletin* is a drawing and brief description of a device called a *Coaxial Junction Box* which can be used to feed up to four outputs from a single input connector. It is a lower cost alternative to the usual **N**-type connectors for harnessing VHF and UHF stacked arrays, the cost being around 30 percent of the N-type connectors it replaces. The device is made by *Acme* and could be worth investigating. Although no design parameters are mentioned, the drawing tends to indicate a well-made device.

ANOTHER THREAT TO SIX METRES

March 1986, *QST* and the *World Above 50 MHz* is where Bill Tynan W3XO expresses concern over a proposal filed by Donald Stoner W6TNS, where his petition calls for the re-allocation of 52 to 54 MHz from the Amateur Service to, what he calls, *The Public Digital Radio Service* and is envisioned by Stoner as some kind of super packet system of specially designed transceivers attached to personal computers. He refers to them as *Radio Modems* which would exchange data at a very high rate, which explains the *need* for two megahertz of spectrum space to accommodate a single channel. Many users *would be* able to occupy one channel probably through time sharing. Data would be relayed through whatever series of radio modems would be necessary to get to the addressed unit.

The radio modems would include a power-management feature enabling each to adjust power from a maximum of one watt down to a few milliwatts, the automatic selection of level being that necessary to maintain contact with the next unit in the net. Bill says; *"One wonders what a person not having another radio modem within relay range would do?"* W6TNS's petition states he selected the six metre band because *"it is essentially unoccupied"* and use of frequencies in this part of the spectrum would make the radio

modems cheap.

The ARRL has filed a strongly worded brief opposing the Stoner proposal. It takes exception to deleting half of the amateur six metre band to create the new service when the Amateur Radio Service already makes use of packet radio which enables the inter- connection of home computers. They also dispute the contention that the six metre band is *essentially unoccupied*. There may be periods of low level activity but the interest generated in the band, especially during the peak of the last solar cycle had to be observed to be believed.

While this may essentially be an American problem at the moment, it is almost certain such moves will not remain there. I bring the above information to the notice of the Australian six metre fraternity as a timely warning on how it is possible to erode portions of a band in the interests of some new technology. One should not stifle the development of anything that is new and worthwhile, but there needs to be very solid justification for the establishment of a mode of operation which demands two megahertz of a world-wide amateur band. No doubt, it is cheaper to build something for use n six metres, but if that degree of spectrum space is required, then it seems the use of frequencies higher up in the scale must be considered. After all, the CB users were given the 470 MHz band when they went to FM (a wide band mode) and have had to accept the limitations imposed by higher cost, reduced operating distances, etc, but the CB UHF band has proved an unqualified success despite these limitations. It is to be hoped the Stoner proposal receives enough flak to ensure it does not become established in the six metre band, either in the US or anywhere else, for that matter.

NEWS FROM ESPERANCE

David Lloyd VK6AOM, at 23A Butler Street, Esperance, WA. 6450, has written the promised letter which I asked for during a six metre contact last December. Whilst he says some of the news is somewhat dated, the fact that he is 1485 km from Adelaide instead of the 1885 km from Albany, the saving of 400 km on the path might generate more than a passing interest to those operators who are ever ready for contacts across the Great Australian Bight.

"Too little, too late, sums up a lot of amateur operation and despite a shift of QTH to Esperance in December, construction and erection of an antenna system followed the usual rule, expressed above. So it was late December when I at last managed to place my eight element Yagi on six metres at a height of 10 metres.

"This, prompted by the acquisition of an FT480, provided me with a great six metre season. From 19/12 to 31/12, I worked 90 stations including 30 VK5s, six VK4s, 20 VK3s, 10 VK2s, two VK1s, four VK7s, four VK8s, and ZL. January netted a further 300 contacts including P29QA and a VK6! Some of the contacts into VK8 provided incredibly strong signals.

"Naturally, through all this, the question most often asked was; 'Have you got two metres and 70 cm?' The answer was yes, but unfortunately the antenna systems were still on the ground. The only operational systems I had were mobile — a stacked five- eighth collinear on 70 cm and a quarter wave on two metres, on the carl Still on the ground were four 12 element wide-spaced Yagis for two metres, and four 12 element Yagis for 70 cm. After building new power splitters for both bands and commandeering a football team, who were having a barbeque next door, my array was in the air — but again, too late!

"On 24th January 1986, I was tuning a six element Yagi for 70 cm on my front veranda; after getting the SWR down to 1.06:1. I laid the antenna on the ground and idly tuned the FT780 to 432.100 MHz. To my amazement, I heard signals! By holding the Yagi in one hand and the microphone in the other, I worked VK5ZVG! This prompted a rapid trip up Wireless Hill, at the other end of town (towering fully 60 metres above Esperance), and using my FT480 and FT780, with the mobile whips, worked VK5ZDR, VK5ZGV, VK5ZTS and VK5ATD on 432.100 MHz, as well as VK6BE, VK5ZGV, VK5ZTS and VK5RO on 144.100 MHz on SSB.

"Flushed with this kind of success, I built a six element Yagi for two metres next morning and returned to Wireless Hill in the evening to try again. The band was magnificent! I worked the following on 144.100 — VKs 3ZBJ, 5ZMJ, 3KAJ, 3ZAT, 3ZL, 3NM, 5ZBU, 5NY, 3UV, 3AQR, 3KEG, 3ZQB, 5RO, 3WN, 5ZVA, 3ZYN, 3RK, 5BWI and 3KXW. On 432.100, I worked VKs 5AEI, 6DM, 5ZMJ, 5ZDR and had several dual contacts with the stations listed. Power out on both bands was 27 watts PEP

"On Australia Day, 26/1, I took my 432 MHz linear along plus the two six element Yagis I had recently built and my log lists on 432.100: VKs 5ZDR, 3KAJ, 3ZOB, 3KAQ, 3ZBJ, 3BDL, 3AUI, 3ZYN, 3AIH, 3NM, 5NY, 5RO, 5ZMJ and 5ATD. On 144.100 there were VKs 3BDL, 3AZY, 3AMZ, 3ABO, 3AUI, 3KKD, 3KXW, 3DQJ, 5RO, 3UV, 3KAQ, 5ZMJ, 3ZBJ, 3KAJ, 5ZRG, 3AMZ, 3NM and 3DFI. All contacts were on SSB on both bands.

"I have received a number of QSLs direct — my address is not correct in the Call Book. For convenience the correct address is as below.

"In the interim, I have finished my eight by 15 element Yagis for 70 cm and have acquired two commercially built push-pull 4CX250BC transmitters and have one on two metres already, and I am building a K2RIW amplifier for 70cm in the other. I also have all modes on 1296 MHz but the final in the linear has died and until I can replace it I will have only 10 watts output. If it was not for the interference which work provides, I would have antennas built for 1296 also!

"I am up and running on OSCAR-10. For the record, all antennas are fed with Heliax and I have masthead amplifiers for all bands. I will be happy to sched anyone for the winter DX season and look forward to summer 1986. QSL information: C/o Radio 747, Esperance, WA. 6450".

Thanks for the letter David, it will give readers an outline of the potential of your station which must be placed in the category of being exceptionally well set up. I hope your present success will stir more to try and work you, especially with the 400 km bonus in the shorter distance,

As so happens with my further inland location, whilst all that great activity was going on between David and VK3 and 5, I had to be content with sitting on the side hoping the conditions would shift further inland, but they did not, hence I missed out again. My 60dB mountain attenuator was firmly in place as always on 70 cm.

NEW SA TWO METRE RECORD.

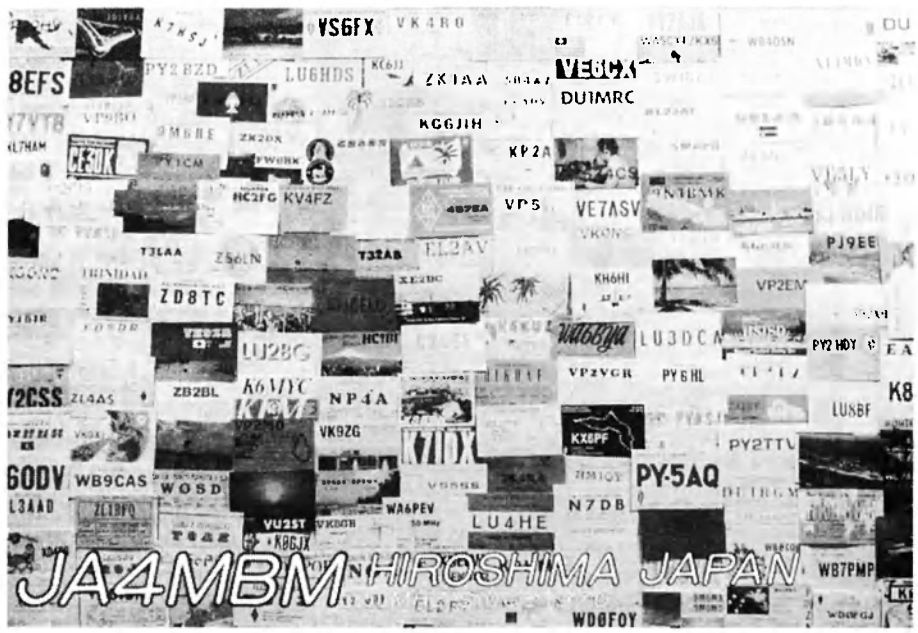
I mentioned in the March issue that a brief two metre opening had occurred between VK5 and ZL which enabled a number of stations to work ZL for the first time. My note book at the time carried a comment that a vague report had been received of a station in Woomera working ZL on two metres. Not being able to verify the comment I did not mention it.

However, it does now appear that on 16th January 1986, Neil VK5ZEE at Woomera, did in fact work ZL1HH, which upon verification will stand as a new two metre record for South Australia. Exact distance is unknown but would be around 3400 km which eclipses the former record held by Hughie VK5BC to ZL2HP at 3149 km set on 23rd December 1965.

I have not been able to contact Neil direct, but I telephoned Don VK5ZRG, at Whyalla who was able to confirm that the contact had been discussed on the local repeater with Neil participating so it seems authentic. We offer our congratulation to both parties for such an effort and I expect to hear more in due course when the record is confirmed.

Geoff XE1GE, a well-known six metre operator.

Six metre QSL Cards on the Shack Wall at JA4MBM.



GENERAL NEWS

I am again holding over the letter from John VK5UL, regarding his early operations on the five metre band. I need more space than is available at the moment so will include same as soon as possible.

The photograph of QSL cards on the shack wall at JA4MBM carries many familiar six metre call signs and you may find it of interest to study it. I am indebted to Graham VK8GB, for this and also the one of Geoff XE1GE, a very well-known six metre operator who has worked many stations in Australia. I have had at least four contacts with him.

Generally speaking the VHF bands have been relatively quiet this month. This is not unusual after the Es summer period. What I do find interesting is how rapidly the Es seem to die out or else the operators tire, but the lead up through October and November sees quite a few good openings around the country, culminating in the best periods in December and early January. But come mid-January and the six metre band seems to flop and that is it for another nine months, except for an occasional opening which can come at any time.

Alterations to the Six Metre Standings must be on my desk by 15th June if you want to be included in the August update. And while on six metres, there were a lot of on-air comments regarding the pros and cons of the Ross Hull Contest but I have not had much feedback yet with your suggestions for improvement. Is it going to be left to the last minute again? ? ?

Closing with the thought for the month: *Confess you were wrong yesterday; it will show you are wise today* 73 — The Voice in the Hills.

AR

Amateurs that attended the *Maitland Mob* get-together. From left to right — front to back: VK2s KQ; KF; DH/P; VO; PZ; TY (jnr); TY (snr) was 2SH; UI; XT was BH; AMM; CW; YJ was AJE; AJV was EP; XQ; ZC; GH was XH; CX was JE; KZ; KB; KG; AHA; OS; AAX was AGY. The receiver in the photograph is a 1922 home-brew unit. The gentleman in the dark jacket, mid-front is Russell Troy. He is not an active amateur now but still does his own shopping on a push-bike.

The "Maitland Mob" Get-Together

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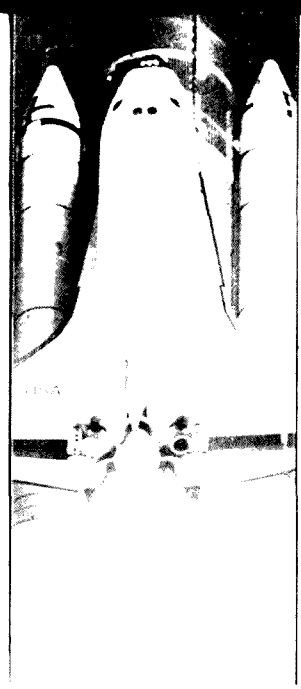

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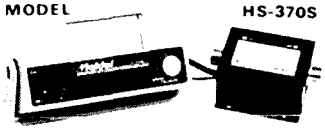

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MFJ-250 Low SWR to 400 MHz, 2 KW PEP, supplied with transformer oil.

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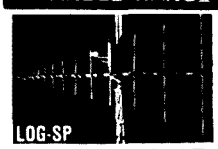

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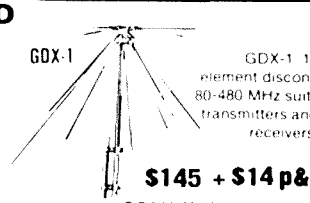

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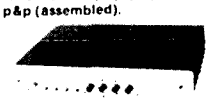

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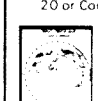

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How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

Well! The ARRL are now going to allow DXCC credit for 18 and 24 MHz! My personal thoughts are that I cannot agree with the ARRL Directors decision to allow this DXCC credit and apparently any applications can be backdated from the inception of the usage of the band in that country.

A lot of readers will say that I do not agree with anyone and they are probably right but this move is inconsistent in my book. As yet, not everyone has the privileges of these bands that were won for us by the amateur societies throughout the world. Also, not all amateurs have WARC band facilities on their transceivers, although transverters may be easily and cheaply made. And finally, not all countries that have allowed these bands to be released to the amateur service are consistent in their band planning across these segments of the spectrum.

I feel that these bands should be left out of DXCC until all DXCC countries grant the privileges and that the frequency segments are uniform. Then if it is really necessary and only if, allow it from a period in advance of the announcement date. By doing this it will be an achievement that will be appreciated by the amateur fraternity as a whole not the minority.

160 METRES

It is interesting to note that as of 1st August, this year, Hungary will be authorised to use the 160 metre band.

DON'T BE CAUGHT

It appears that the a number of amateurs have been receiving correspondence from the DOC with reference to the DX *window* in the 80 metre band where an alleged number of stations have been out of the band.

No transmission is to be outside the limits of below 3.794 MHz or above the upper band edge of 3.800 MHz. For further information refer to the QSP in this issue and learn how *not* to get an unsolicited questionnaire from DOC.

This also applies to the band-edges of other bands.

CLIPPERTON — Not so Quiet?

French owned Clipperton Island, a tiny atoll 600 nautical miles east of Acapulco, will be fitted out as a stopover and shelter for the tuna-boats and sail-boats navigating through that part of the ocean, according to an announcement from the French Government. The idea was first discussed by Dr Andre Rossfelder, president of an exploration company based in La Jolla, California.

Work needing to be done on the atoll will consist of reopening an old pass on the north-east side of the atoll, dredging a berthing area in the lagoon, building a pier, and cleaning up an old WWII American airstrip.

Before this development begins an exploration program will be conducted by a Mining Syndicate on Clipperton. (In 1975 it was discovered there were phosphate resources and precious metals in Clipperton's sulphurous lagoon).

Clipperton is small, uninhabited inhospitable, and the only atoll in that part of the ocean. But, to Californian fishermen and yachtsmen heading for the south-eastern Pacific it is a welcome landfall, a rocky out-cropping in the shape of a ruined castle which allows them to check their navigation but, at present, anyway, does not invite them to call.

The island was formally claimed by France in 1858, but was assumed at the time by many to have been already a US possession under the 1856 Guano Act.

Mexico counter-claimed it in 1897, but an arbitration by the King of Italy finally validated the French claim in 1931.

Despite it remoteness and barren aspect, Clipperton has a rich history intertwined with the history of California, USA, from the voyages of Drake and Dampier, to the adventurers of the 19-century guano-seekers of San Francisco, on to the presence of the US military during WWII.

One of the most intriguing tales of all concerns a visit by the American battleship, the USS YORKTOWN, in 1917. The shore party found a group of Mexican women and children, survivors of a long-forgotten Mexican army garrison. And in one of the pitiful huts they had for shelter they found the still-warm, murdered body of the last soldier. How it happened, and why, remains a mystery to this day. (An interesting book about Clipperton, which won the French Goncourt Award for an historical novel, is Andre Rossfelder's *Clipperton, Ile Tragique*).

The establishment of a boat shelter and an airstrip on Clipperton will also allow France to show its physical presence in the region and strengthen its claim on the surrounding 200-mile (322 km) zone which it is reported to be rich in manganese nodules and polymetallic sulphides.

Will this mean that Clipperton will become a more frequently visited DX location and henceforth take it of the much- wanted lists of so many?

Information from Pacific Islands Monthly, March 1986 — contributed by Eric L30042.

RUMOURS

Martii Lane OH2BH, in an exclusive letter to Bob Winn, Editor of *QRZ DX*, explains many of the problems and the high expectations his group had for 1985 regarding Albania. Martti also told of the rumours, which were very inaccurate, to the QSL cards received which were of course bogus.

Martii mentioned the fact that Enver Hoxha, Albania's leader since 1944, died. As he was a *father figure* in Albania it was realised that nothing positive could be expected to happen until the Albanians had sorted themselves out.

"Bahri DJ0UJ, had great expectations regarding his planned visit to Albania in July and August. It was decided not to duplicate any effort during that period. Instead, the idea was to support Bahri in every way and to see the outcome of his efforts first. The equipment already in Albania was scheduled to be used by Bahri, should his endeavours prove successful. Bahri's proposed visit, as part of a tourist group, did not assure him of a visa although he did everything in his power to obtain one. Because of many sensitive national and historical issues, Bahri was working on his project alone — just the way we are working on the Finnish project.

"6-12th December was the date set for a Finnish exhibition in Tirana — one of the first such exercises allowed to be undertaken by a Western country — or any outside country. The organiser and host of this show, covering culture and the arts, was the Finnish Ambassador to Tirana, who was also heading the amateur radio project with OH2NB and OH2BH.

"An extensive package of information and material was presented personally to the Foreign Minister of Albania aimed at providing further training on the subject, with the Albanians having selected a Finnish group for further familiarisation and allowing the Finnish group to demonstrate amateur radio in action.

"A very positive attitude was clearly noticeable, but — as expected — there was no straightforward commitment.

"The world will live on and hopefully 1986 will bring along a true-blue ZA-station on the air".

Late news received stated that an OK-group hope to be operational around the 20th September, but we will have to wait and see.

RECIPROCAL AGREEMENT

It appears that France and Japan will sign a reciprocal licensing agreement in the near future, particularly when translations of their regulations are exchanged. No mean feat for any interpreter! !

WHIRLWIND TRIP

The Pacific whirl by JJ1TZK is over and he is now at home watching the cards roll in. He visited the following areas using the following call signs: *KC6MR/KC6, C21NI, ZK2JA, JJ1TZK/KH8, -AH8, -NH8, ZK1XR, 5W1FJ, A35ZK, 3D2JA and T21ZK.*

Rolf PY1RO, pictured climbing his 60 metre tower. Rolf is mainly active on 160 metres CW.

PACKET RADIO

A recent letter from Barry VK2AAB, shows that the packeteers are getting plenty of DX. Barry states that Brian VK2CMC, has worked the following on 14.103 MHz. *JA1DSI; JA5TX; JA3AOU; YJ8RG; DU1UJ; 9M2OK; 9M2CR; 7D1AAE, N6DDG; KA6ERF; KA6NIY; WR4B; WA4RVO; X31TU; YB1BG; YB3CBF; DL4GL; I3VQW; I3FWY; ZS5AAN; K4EI/MM; VK2BVS; VK2AQG and VK2AAB via YJ8RG.*

Barry meanwhile has worked: *YJ8RG; K7TBT; I0APV; I0ZV; G3LDI; JA5TX; and JA1DSI.*

Barry says that most of the activity is on 20 metres at present, however he has heard some activity on 7.093 MHz. Keep up the good work Barry.

FROM LAND'S END TO . . .

From *Land's End to Anywhere*, is the DXer and DXpeditioner's dream and from 23rd to 26th May, many amateurs will be listening for a hitherto unsung, unheard of place 30 miles (48 km) adrift in the Atlantic Ocean, just off the granite cliffs of Land's End, England. It is not a new country but it is certainly something unusual.

Great Ganilly is an uninhabited 20 acre (8 ha) island in the Scilly Isles group, and it from this isolated area that 15 Cornish radio enthusiasts hope to organise a special event station.

The Islands are chiefly owned by HRH Prince Charles, through the Duchy of Cornwall.

The Duchy and the Nature Conservancy Council were unable to allow the radio group use the larger island of Samson because of the wildlife that inhabits it, but after writing to the Duke of Edinburgh permission was granted for the use of Great Ganilly.

The Scilly Islands are made up of five inhabited islands (population 2000), and countless barren rocks and islets and has a riviera-type climate. They were a popular holiday location for former British Prime Minister, Harold Wilson.

Great Ganilly, inhabited by rabbits, seagulls and Bronze Age relics, was chosen by the group for its inaccessibility. One of the expeditioners, Tony Bevington says there is bound to be pandemonium as the group will be carrying radios, aerials, generators, tents, water and food across from the mainland by steamer. Tony and his wife Leila, also an amateur, estimate that over 5000 contacts will be made in 56 hours.

Special call signs for the venture will be GB4IOS and GB8IOS.

The local harbour master for the capital island of St Mary's, Colin Oakley, himself a radio enthusiast, will be acting as the party's co-ordinator.

Apart from anticipating plenty of radio contacts, the party will raise funds for the British Lifeboat Institution — particularly appropriate gesture in sea-faring Scilly!

It is interesting to note that during his wireless pioneering days, Marconi ventured to the Scilly islands and relayed signals back to the Cornish mainland.

Information supplied by Clive Mumford.

BITS FROM HERE AND THERE

Beware of OY7ML who is QRV on weekends. It could be a pirate as the real owner of the call is mostly QRV on week- days after 1800 UTC. * * Carlo I5JEO, was quite active as KC6CM earlier in the year. Please QSL to the home call. * * Iris and Lloyd made 6 500 contacts from A2 and hoped to work from yet another country before returning home to the USA. * * Don't miss the USSR CQ 'M' Contest on the 10th and 11th of this month. * * ZL7AA is quite active from Chatham Island and can be worked on the 40 metre net of Eric ZL2AAG. * * William I0WW, US Ambassador to the Holy See suggests late this month or early next month will be the time to work 1A0KM, when it should appear. * * Hans DK1RV, states that anyone with little luck could have been well on the way to the ultimate with their DXCC last year as there were 273 countries on the air. Not bad pickings for anyone starting out but a poor show for anyone with their eye on the ARRL DXCC Honour Roll. * * Henry G3GIQ, well-known to VK DXers with his massive signal, has notched up 1500 *band* countries on 10 through to 160 metres and that's excluding the WARC bands. Congratulations on your tenacity Henry! * * Don't miss JW5OCA and JW6HAA, who will be active until the end of next month. * * Another unusual call TV6BFI, will also be active till the end of next month. * * The Norwegian Government have not issued permission for any current plans to operate Bouvet or St Peter 1 Island as of when these notes were being prepared in mid- March.

PITCAIRN

I had the pleasure recently of meeting Jim G3OKQ/VR6JR/VK3AUT, to name but a few of his current call sings. Jim was also PX1OK, later to become C31BY, when he was signing out of the Andorra's, some years back.

Photograph courtesy of Ken McLachlan VK3AH.

Jim pictured with his TS120 and trusty Antenna Tuner.

Jim, on a brief visit to Melbourne, was accompanied by his charming wife Noreen and they were the guests of Ron (VK3OM) and Lynette Fisher, during their stay in the Garden State.

Jim had been the guest of Tom and Betty Christian VR6TC and VR6YL, respectively and their four daughters Jacqeline, Raelene, Sherilene and Darlene, since the beginning of June last year, whilst he was assisting in reconstructing the wharf at Pitcairn.

Jim left Pitcairn en-route to New Zealand, where he met Noreen and journeyed on to Melbourne.

PITCAIRN'S HISTORY

Pitcairn, an island of one of the most isolated group of islands In the world and is located at 25 degrees 4 minutes south by 130 degrees 6 minutes west. Pitcairn itself is 3.2 km long by 1.6 km wide. The island group consists of Ducie, Henderson, Oeno and Pitcairn. Pitcairn, which is the only inhabited island, had a census of 64 people at the last count. Of these, 51 are actual islanders, the others being a medico, school teacher and pastor with their respective families.

The island group was discovered in 1767 and originally named Pitcairn's Islands, after its discoverer, but in latter years the *s* has been dropped and it and the other islands are referred to as Pitcairn Island.

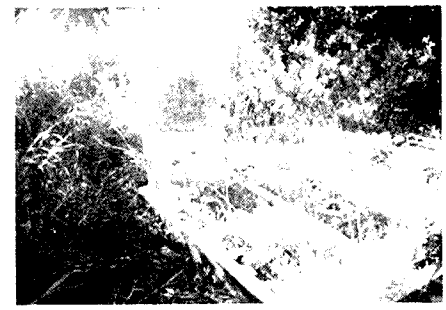
In January 1790, nine mutineers of the HMS *Bounty,* accompanied by 12 Polynesian women and six men, left Tahiti and were not heard of again for nearly 20 years. They arrived at the uninhabited group of islands and decided to settle on Pitcairn.

One of the Bounty's Anchors.

The land on the inland was divided among the mutineers and the natives were used as slaves, and as such were very poorly treated. The early years were quite violent, so badly so that all of the six Tahitian men and seven of the mutineers met violent deaths. One of the two remaining men died of respiratory trouble, leaving Alexander Smith, the sole surviving male.

In 1808, the island was visited by the *Topaz, whose crew found the small community of Tahitian women and half caste children living under the pastoral care of Alexander Smith (later changing his name for some unknown reason to John Adams) who had become a devout student of the Bible and Book of Common Prayer salvaged from the Bounty before it was burnt on their arrival on the island. He was allowed to spend the rest of his life on the island with the surviving women and children.*

By 1856, the population on Pitcairn had increased to such a degree that the island could not support them and the British Government evacuated the island's entire population to Norfolk



John Adam's Grave.

Island, which was stocked with sheep, cattle and horses for their benefit. Norfolk had been used as a convict settlement until 1855, where life was rather unpleasant, but that is a story on its own. (The main population of Norfolk, incidentally can be traced back to the Pitcairners who arrived at that time.

Within 10 years most of the Pitcairners had moved back to Pitcairn where they have remained. This has formed the basis of the families today that happily live on the island.

Church.

The islanders are deeply religious. An American missionary arrived around 1886 and converted everyone to Seventh Day Adventism and hence the word of the church is law. This provides a harmonious atmosphere and no one on the island can recall a major crime.

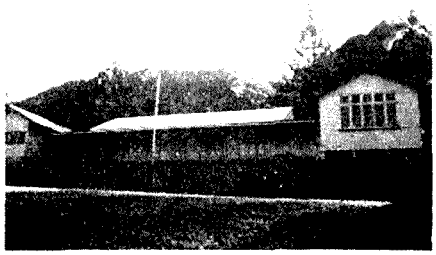
As there is no natural harbour, ships are required to anchor of the island's shore and the islanders row out to receive mail, etc and sell the trinkets that have been made on the island.

Ships Landing Point.

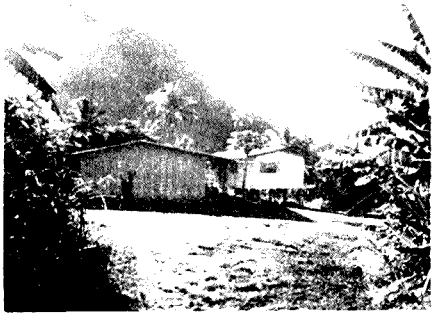
The history of these islanders is enthralling reading and most libraries have or can obtain a number of books which are well worth reading including one book which traces the dialects used on both Norfolk and Pitcairn in detail.

As stated previously, Jim had gone to assist in repairing the wharf, which was in quite a state of disrepair due to the tides, even though it can only handle the Long Boats, which are vessels approximately 12 metres long, and can carry a capacity of up to five tonnes and have a shallow draught, as Bounty Bay is only about two metres deep at high tide. Jim said "at times they unbelievingly looked liked match sticks being tossed around in the shallow water".

Jim left home on the 18th May last year aboard the 229 tonne cutter *Vibke*, with a Danish registry, hence the unusual call of G3OKQ/OZ/MM which he used for his 190 SSB contacts from the 45 metre long by nine metre beam sailing vessel whilst en route to the Pitcairns. The vessel arrived correct to schedule on the 1st of June, anchoring off Bounty Bay and unloading all the supplies into the Long Boats. This was a very slow business due to the cargo weight and the prevailing weather conditions.

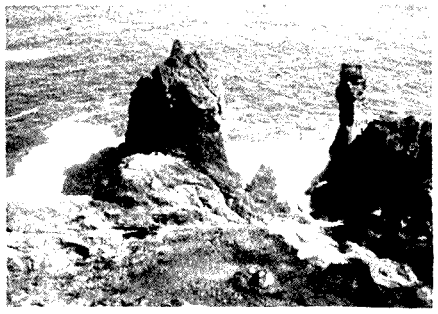


School and School House.



Hostel.

Radio Station.



St Pauls Pool.

Jim recalls, that whilst working on the island, at times waist high in water, welding mask in one hand and electrode holder in the other with about 40 volts potential and untold amperes available, it was quite uncomfortable when a wave hit you, which was quite frequent. Incidentally the tide swing is about one metre.

The weather on this friendly island is quite

Pulwala Valley.

temperate, the lowest temperature being about 12 degrees, the highest 30 and an average in the comfortable mid-20s. The island is well above sea level, the highest spot being some 336 metres ASL and the area is very undulating allowing little cultivation though the soil is very fertile.

This island boasts two dogs, many cats, one rabbit, six ducks, many chickens and one tortoise. Fishing is a way of life and it was interesting to see Jim's videos of the difficulties experienced in beaching the longboats and of the mountainous terrain with such proximity to the beach. Luckily they have a little beach buggy, 15 tri-cycles, one bulldozer and a couple of tractors.

Amateurs are not scarce on this out-of-the-way small island. Firstly one would have to mention the *Marconi* of Pitcairn, Andrew Young who was born in 1901 and had the call sign VR6AY, then Tom and Betty VR6TC and VR6YL, Kerry Young VR6KY, Nig Brown VR6KV, who is also the islands Police Officer and a new licensee Irma Christian who uses the call VR6ID.

Jim did most of his operating from Tom's QTH and had nearly 12 000 SSB contacts on 20, 40 and 80 metres using his trusty TS120 from battery power and his antenna tuner. Jim on occasions used Tom's TH3 at 12 metres but generally used dipoles strung as high as possible.

Jim had a marvellous time, living with these friendly people and managed to spend some time on the radio nearly every day he was on the island. Jim enjoyed joining the nets that Percy VK3PA, and Eric ZL2AAG so efficiently run and he luckily avoided many *dog piles*.

All QSLs are to go to his home QTH as per the Call Book address or via the Bureau.

Photographs on Pitcairn Island (including cover) courtesy of Meralda Warren.

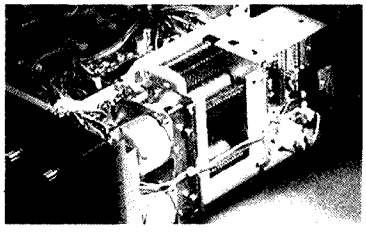
THANKS

Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CO-OSO, DX FAMILY FOUNDATION NEWSLETTER, INSIDE DX, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, ORZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, cqDX, JA CQ, JARL NEWS, KARL NEWS, PACIFIC ISLANDS MONTHLY, OST, RADCOM, VERON and WORLDRADIO. Members who have contributed include VKs 2HD, PS, AAB, EBX, 3OM, YJ, YL, 6HD, G3NBC and L30042. Overseas amateurs include AH2BE, KB6OAW/KH2, ON7WW, WB6GFJ and ZLs 1AMM and AMN. Thanks to one and all who have made this column possible.

AR

KENWOOD

TS-440S



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Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

MAY	
3- 4	*County Hunters SSB Contest (See comments below)*
3- 4	*Armadillo Run* SSB (See comments below)
3- 4	Florida QSO Party
- 4	DARC Corona *10m RTTY*
10-11	*USSR CQ-M Contest*
10-11	*New York State QSO Party*
17-18	*ARI International Contest (Rules April issue)*
17-18	*Michigan QSO Party*
24-25	*CO WW WPX CW Contest (See comments April issue)*
27-28	*1986 CLARA AC/DC "Mystery" Contest (Rules March issue)*
JUNE	
21-22	*1985 VK Novice Contest (Rules this issue)*
28-29	*ARRL Field Day Contest*
JULY	
12-13	*IARU Radiosport*
26-27	*Armadillo Run CW (See comments below)*

ARMADILLO RUN

I quote directly from notes supplied to me by Frank Anzalone W1WY, who is the DX Columnist for CQ magazine and would point with some emphasis to the VK5 involvement in this event.

"SSB — 3-4 May. CW — 26-27 July. 0000 UTC Saturday to 2359 UTC Sunday. (Rest period 0800 to 1200 UTC).

The Texas DX Society is again sponsoring this popular activity. This years *run* is in commemoration of the Texas Sesquicentennial (150th year of statehood). This promises to be the real big one as their goal is to activate all 3076 US Counties, plus a newly created Armadillo County. The new county will be recognised from 2nd March to 31st December, not only for the two weekends of the run, but also available for the CQ USA-CA awards program.

You will note that the dates and times are the same as for the County Hunters Contests. The exchange and other features are also the same. (County Hunters rules also included below — VK5QX).

There will be special Armadillo Run stations on between 1300 and 0100 UTC, Saturday and Sunday, activating their assigned counties on 20 and 40 metres.

Scoring is the same as the CHC Contests, with the following additions:

Australian counties will also count as multipliers. Armadillo County, Texas counts five times QSO points. South Australia counts 10 times QSO points. And any VK5 station counts five times QSO points. (Since 1986 is also the 150th Anniversary for South Australia, they plan to run joint activities with the Texas Armadillo Run).

There will be awards galore, more than can be covered in this edited announcement. I strongly advise interested amateurs to send a large SASE to Tom Taormina K5RC, 12610 Barbizon, Houston, Texas. 77089, for a copy of the Armadillo Press with all the details and a list of regional co-ordinators.

Logs to The Texas DX Society, 350 Magnolia Bend, New Caney, Texas. 77357, and must be received within one month after the contest date".

Whilst the above, with regard to VK5 stations and South Australia may seem a little confusing I can only interpret it to cover the fact that a VK5 station could be operated from a state other than VK5 in a portable/mobile capacity. (VK5QX).

(A brief resume of the event was published in December AR, p 28).

COUNTY HUNTERS SSB CONTEST

From 0001 UTC Saturday to 2400 UTC Sunday, 3-4 May. (Rest period from 0800 to 1200 UTC each day). This is the 15th Annual Contest sponsored by the Mobile Amateur Radio Awards Club, to increase activity for the County Awards program. The two four-hour rest periods are mandatory.

Emphasis is on mobile operation. Fixed stations may work other fixed stations, but only once regardless of the band. Mobile stations may be worked from each county or band change. Mobiles contacted on a county line count as one QSO but two multipliers. QSOs made on a net frequency do not count.

Exchange — Signal report, county and state, country for DX stations. (Mixed mode contacts are permitted provided one station is on SSB).

Points — Contacts with a fixed W/K station, one point (including KH6/KL7). Contacts with US mobiles, 15 points. Contacts with US mobile team, 30 points (both operators participating).

Final Score — Total QSO points, times the total number of US counties worked.

Frequencies — 3.870-3.890; 7.225-7.250; 14.250-14.285; 21.360-21.380; 28.570-28.600 MHz. Following spots considered *Mobile Windows. 3.875; 7.240; 14.270 MHz ±5 kHz.* Fixed stations must QSY after working a mobile. (Australian amateurs are reminded some of these frequencies are out of band).

Awards — Plaques to the first and second place US Mobile; top scoring fixed US/Canadian, DX station, and Mobile Team. Certificates to the top 10 mobiles and to the top scorers in each state, province and DX stations.

It is suggested that you send a large SASE to WA5DTK, for detailed rules and log sheets. All entries must be received by 4th June, and go to Barry Brewer WA5DTK, PO Box 65, Randolph AFB, Texas. 78148. Winners will be announced at the County Hunters Convention and in the MARAC Newsletter. (Include a large SASE for copy).

So there are a couple of quite interesting and different events for you to try your hand at. I know that I always get a thrill from contacts with mobile DX stations and particularly so when I am operating mobile myself.

Speaking of being out mobile or portable provide an opening for a short comment on the John Moyle Memorial Field Day Contest, held just before the preparation of these notes. Here in VK5, the weather was really ideal for such an outing and I personally enjoyed it greatly, although rather disappointed that I could only be in the six-hour section of the contest. I found conditions to be excellent, particularly on 40 metres. On that band, I was constantly called by European and G stations. One W station attracted my attention to the higher part of the band and, having joined him there, I was told that I had the strongest signal of any VK on the band — at least 15 dB over S9, and the strongest he had heard in a long time. I cannot say that I was displeased at this information. I had gone to a lot of trouble to have my dipole for the 40 metre band up to a height of about 60 feet (18m). I do however, wonder whether that was such a good idea for the Field Day Contest as the lower angle of radiation may well have meant that my signal was skipping over the closer interstate stations. Anyway, I do hope that you enjoyed your participation in the Field Day Contest. I will also be most interested in hearing what the various weather reports will be from each of the states. Maybe this year the VK4 boys were not rained-out after all. Incidentally the good conditions resulted in me being called by a ZF station on 40, which is a country that I still need confirmed!

This month, I provide, as promised, the rules for the 1986 VK Novice Contest. I would hope to see a great deal more entrants this year, as the time of the year should provide much better conditions on the main Novice band of 80 metres.

The rules are virtually unchanged from last year, and unless some good reason rears it head, could probably be considered now to be fairly well established to this format.

An interesting letter from Bob VK7NBF, just received, makes comment on the remarks in my column regarding lack of CW operation by Novice stations in the 1985 VK Novice Contest. His letter is certainly worth quoting.

"Thank you for inviting comment on the remarks made regarding the lack of Novice activity on CW during the above contest. I am the holder of a Novice licence, but I have passed the 10 WPM test so I cannot be regarded as one who dropped CW altogether and I still enjoy the occasional OSO with the key.

"There are two main reasons why I do not participate in the CW section in contests. First is the overcrowding on the narrow band available. Second is the unfortunate practice of some operators using their 100 watts to blank out signals from novice operators using 10 watts. A contest should be an enjoyable experience, but my recent experiences have been more like the survival of the fittest in which the low power operator is thrown to the lions. Current conditions restrict the available bands to 3.5 MHz, where we novices only have the 10 kHz. What makes this more extraordinary is the fact that on SSB nearly all operators are polite and friendly and appear to be enjoying themselves.

"Some of the critics infer that we must qualify for the full call so that we are permitted to use higher power and thus claw our way into a crowded band at the expense of other less fortunate beings.

"Thank you for your regular column in AR and for the work which this must entail".

Well Bob, it is always good to see an opinion well expressed and it is in this way within the ranks of amateur radio that we can benefit by useful dialogue. I would suggest that more considered comment could be forthcoming from members on such subjects and that discussion of this nature would prove of value when the multitude of items come up for consideration at the Annual Federal Conventions.

Not everybody may agree with what Bob has to say in his letter. If you also have an opinion, why not go ahead and make it known publicly. I would certainly like to hear a great deal more expressed regarding the Ross Hull VHF Memorial Contest. Surely there is a much greater body of opinion than the few letters I received with the logs submitted. Maybe however, there is really no great interest in that contest after all!

I would also like to express my own personal opinion through this column, realising that as I do so I am in a privileged position. I firmly believe that the fact has to be recognised by everybody, member and non-member alike, that the WIA is accepted by the Australian Government as the official representative body of amateur radio operators in this country. This therefore means without any doubt, that the best way of dealing with any matter which affects the amateur service within this country is to have it taken up within the forums of the Wireless Institute of Australia. The organisation may have its shortcomings, and what organisation hasn't, however, it has served us well for many years and, here in Australia, we are a lot better off than our counterparts in many other countries. If it had not been for the watchfulness of those dedicated few who have held office in the organisation throughout the years and for the way in which the affairs of the WIA are conducted, this may well have not been the case.

I would suggest that if you are a non-member reading this you might give this you might give this approach to things some serious thought. What better way to work for change for the better than by doing it where it will be most effective? There is not much to be gained by sitting on the outside complaining about the way the WIA does things when, as a member, you could be making a more useful contribution to our hobby and helping to put right those aspects where you think things are wrong.

Just to hearken back to Bob's letter again, I would certainly make a plea for full call operators to consider the advisability of reducing their output power in crowded band segments. Whether you are operating in the novice segment or not should make no difference to the fact that you need only run as much power as is necessary to make your contact. At the same time, I would also appeal to those holders of a novice call to realise that the novice sub-bands are just that, a sub-band within an amateur band, and that they are not for exclusive novice use. It would appear from my observations that quite a number do not understand this fact. The full call operator does have the use of all portions of the allocated amateur bands.

Finally, on this particular note, I might point out to all that we only occupy the spectrum made available to us as a privilege and not a right. It is certainly incumbent upon all licence holders to treat this privilege with respect and carry out our operations in a manner which will not jeopardise our existence as amateur radio operators.

By the time you read this material, the 1986 Federal Convention will have passed. I would like to think that in the contest area, realising also that amateur radio is not just contesting alone, I will have been able to make a further contribution towards improving this facet of our hobby. Yet, I do have a few ideas left to expound upon and these will have been covered in my report to the Convention.

Meantime, please also continue to let me know about your ideas on contests and their associated aspects and problems. Again, I would point out that I cannot undertake to answer every letter, however, I would like to think that I can cover most aspects of your queries in the treatise which appears in this magazine.

So, enough of the *soap-box* for now. I trust that you will enjoy the Novice Contest and that I will have the opportunity of exchanging serial numbers with you. So for yet another month I will wish you all the best in your activities.

73 de Ian VK5QX.

VK NOVICE CONTEST 1986 — Rules

Contest Period — From 0800 UTC, 21st June 1986 to 0759 UTC, 22nd June 1986.

Objects of the Contest — To encourage contest operation of amateur radio stations in Australia, New Zealand and Papua New Guinea, with special emphasis on contacts with novice and radio club stations.

Station Eligibility — Only stations in VK, ZL and P2 call areas may enter. No stations outside these areas are permitted to be worked or entered in a log for the purposes of this contest. Except for radio clubs, no multi-operator operating is allowed. Stations in the same call area may contact each other as well as contacting stations in other call areas.

Contest Bands — All operation must be confined to within the novice frequency sub-band allocations in the 10, 15 and 80 metre bands. No cross-band operation is permitted.

Modes of Operation — Only Phone or CW may be used. In the CW mode, operation must not exceed a speed of ten words per minute. This is to encourage the use of CW by all operators and to allow improvement in this mode by those operators who do not usually practice same.

Contest Sections — a) Phone — Novice/Full Call. b) CW — Novice/Full Call. c) Listeners.

Scoring — Transmitting Entrants: for contacts with a Novice Station — five points. For contacts with a Club Station — 10 points. For contacts with a Full Call station — two points.

Listener Entrants: for Novice/Novice Contact — five points. Novice/Full Call Contacts — two points. Full Call/Full Call Contacts — two points. Any contact with a Club Station — 10 points.

Call Procedure — For phone operation call *CQ Novice Contest* and for CW operation call *CQ N.*

Contacts — Any station may be contacted only once per mode per band.

Number Exchange — On phone, stations must exchange a serial number comprising an RS report followed by three figures. The figures must commence with 001 and increase sequentially by *one* for each contact up to 999. If 999 is reached the serial number is to revert back to 001 and the sequence recommenced. For CW stations must exchange a serial number comprising RST report followed by three figures on the same basis as described above for a phone contact serial number. Radio club stations must add the letter *C* following the serial number.

Log Entries — Each log sheet should be laid out such as to provide columns in the order given as follows: *Date/UTC Time, Band, Mode, Station Contacted, Serial Number Sent, Serial Number Received, Claimed Score.* Total Claimed Score should be shown at the bottom of the Claimed Score column for each page. Each log sheet must also be endorsed at the top *VK Novice Contest 1986.*

Front Sheet — A front sheet must be attached to each log entered and must carry the following information: *Name of Operator, Address, Call Sign, Section Entered, Claimed Score.*

Declaration — The Front Sheet must also carry a declaration which states that *I hereby certify that I have operated within the rules and spirit of the contest.* Each entry must carry the signature of the licensed operator of the station and be dated accordingly. In the case of a club station, the entry must be signed by a responsible officer of the club's committee or a licenced operator delegated by the committee to do so. In the case of multi-operator stations, the call signs of participating operators must also appear on the front sheet.

Regulations — All stations participating in the contest must be operated within the terms of the station licence and applicable regulations.

Submission of Entries — Logs are to be forwarded to the Federal Contest Manager, c/- Box 1234, GPO, Adelaide, SA. 5001. Envelopes are to be endorsed **Novice Contest** on the *front outside.* Entries must be posted so as to reach the box number no later than 28th July 1986. Any entries received later than this date may be used as check logs only.

Certificates — Certificates will be awarded to the top scoring entries in each section at the discretion of the Federal Contest Manager and to any other entrant where meritorious operation has been carried out in the opinion of the Contest Manager.

Trophy — The *Keith Howard VK2AKX Trophy* will be awarded to the novice entrant with the highest aggregate score from both the Phone and CW Sections of the Contest. This trophy is a perpetual trophy and will be held by the winner until such time as it is awarded to a winner of a subsequent Novice Contest. Should two or more aggregate scores be equal a decision will be based on a count back as to the greater number of novice stations listed in each log entry. Should such a count also be equal, the log containing the greatest number of CW contacts will be preferred. In the event of a further tie, under these rules the log will be placed before a committee which will exercise a vote as to the neatest and most meritorious entry.

Disqualification — The Contest Disqualification Criteria, as published in each August issue of Amateur Radio shall apply. Any station observed during the Contest as constantly departing from the generally accepted code of operating ethics, may also be disqualified.

AR

AMATEUR RADIO DIRECTION FINDING CHAMPIONSHIPS

The Savec Radio-Amatera Jugoslavije (Amateur Radio Union of Yugoslavia), an IARU member society invites amateurs to attend the Third World Jubilee ARDF Championships to be held in Sarajevo, Bosnia and Herzegovina, Yugoslavia from 3rd to 7th September 1986.

The championships have been declared as jubilee in order to mark the 25th anniversary of the first international Amateur Radio Direction Finding Competition held in 1961.

It is noted that the host society is also celebrating it 40th anniversary in 1986.

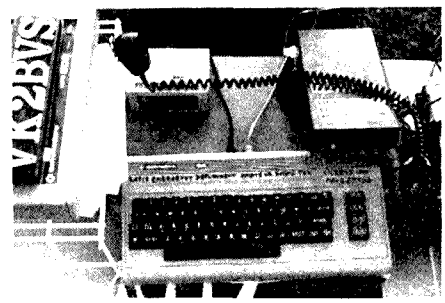
Additional information may be obtained from Savez Radio-Amatera Jugoslavije (SRJ), PO Box 48, 11001 Beograd, Yugoslavia.

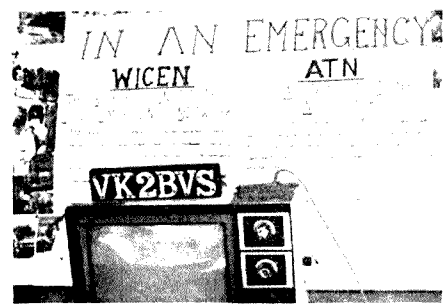
PACKET DEMONSTRATION

During *January*, Sam VK2BVS combined a public display with the annual Sydney Triathalon. This was the first public demonstration of Sam's Packet Radio Station. The station operated from 7pm until 2pm the next day and although a tent was provided by the organisers, it was not used so that the public would have more access to the station.

The entire packet station was powered by a 1.2kW petrol generator which was loaned by the SES. No noise or spike problems were encountered with the generator. When not in use, the television monitor displayed 15 second public relations text about amateur radio.

As well as amateur packet radio and voice links, the SES provided their services during the event.



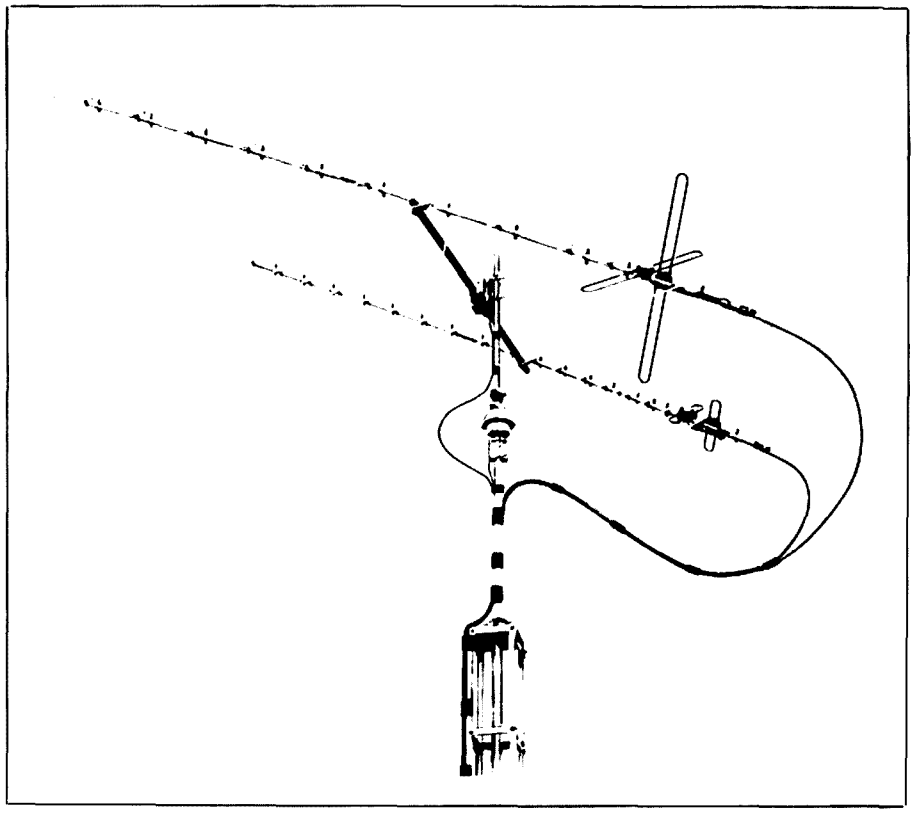


Contributed by Sam Voron VK2BVS

Equipment Review

Graham Ratcliff VK5AGR
9 Homer Road, Clarence Park, SA. 5034

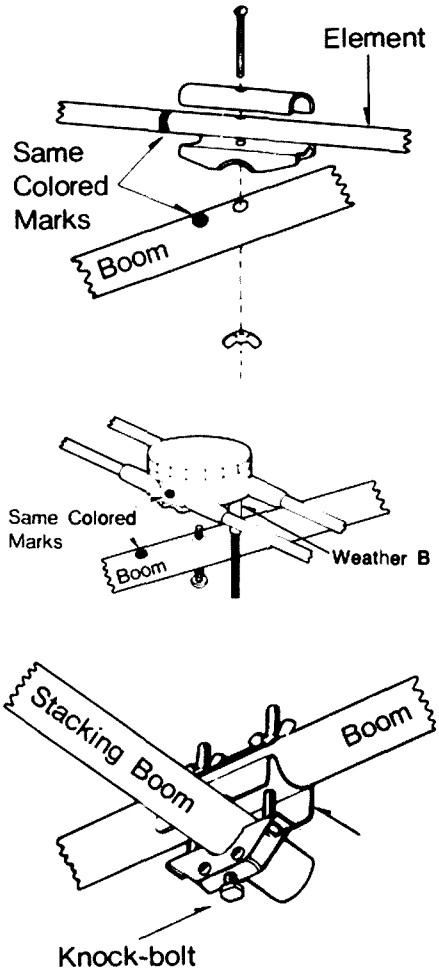
MASPRO Antenna's WHS32

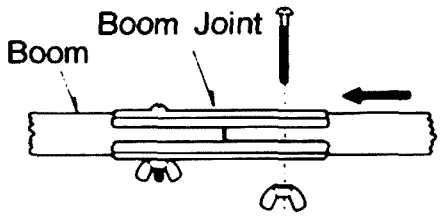


The WHS32 is a complete amateur satellite antenna system in a single package. It arrives in one carton, 2200 mm long, 170 mm wide and 150 mm deep, and weighs less than nine kilograms. The system contains a two metre circularly polarised 24 element crossed Yagi on a 4.11 metre boom, a 70 cm circularly polarised 40 element crossed Yagi on a 3.68 metre boom, plus a 1.7 metre by 40 mm diameter fibreglass stacking boom.

Both antennas are of sturdy all-metal (aluminium) construction (25 mm diameter boom and 10 mm diameter elements) with the exception of the weather-resistant plastic box containing the balun and switches mounted at the centre of the four plastic coated folded dipole driven elements.

Each antenna is supplied with the boom split into two parts. Most of the directors are already attached and all that is required is to loosen the stainless steel wing-nuts on each element and rotate it through 90 degrees and retighten. Then the remaining four directors, two reflectors, and two driven elements need to be added (NOTE: all elements are clearly colour-coded for correct positioning on the boom). Another two bolts with wing-nuts join the two sections of the boom together and the antennas are ready for mounting on the fibreglass stacking boom using the clamps provided on the boom of each antenna.





The final stage of assembly is to attach the coaxial cable to the N-type connector on the phasing harness for each antenna and seal the connectors with the self-bonding waterproof tape that is provided and to connect the 12 volt cable to the two switcher boxes. The whole assembly process should take less than half-an-hour from start to finish.

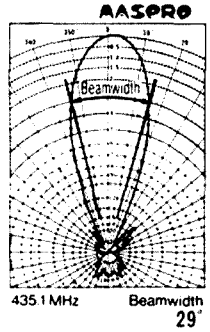
The end result is a comparatively compact and tidy Mode B or Mode J satellite antenna system with switchable left and right hand circular polarisation with excellent performance characteristics. The gain figures are conservatively quoted as 10-12 dB on two metres and 12.5-13.4 dB on 70 cm, with respective beamwidths of 33-35 degrees and 27-29 degrees.

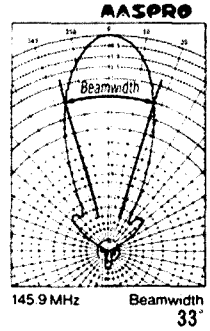
When put to the test at this QTH on OSCAR-10, Mode B, both antennas noticeably out-performed my existing antenna system which comprises a 2M-14C on two metres and a 435-18C on 70 cm, with quoted gain figures of 11 dBc and 12 dBc respectively.

For the amateur satellite enthusiast the WHS32 offers the ultimate in Japanese ingenuity in the adaptation of a well-proven satellite antenna design at a competitive price.

Further information may be obtained from Sonique Pty Ltd, 112 James Street, Templestowe, Vic. 3106. Phone (03) 846 3032 or ZZV Antenna Farm, PO Box 160, Cardiff, NSW. 2285. Phone (049) 54 6688.

AR





Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton. SA. 5014

DXCC UPDATES

This list covers the period since the list published in Amateur Radio, September 1984.

It does not include those with scores of 270 and above, whose updated scores were published last month. The scores are of countries in the current list. Countries which were current when worked, but now deleted, are shown in brackets.

Call Sign	Date	Phone	CW	RTTY	Open
VK1WB	*11. 3.86*		147(30)		
VK1ZL	*29. 7.85*	181			
VK2AAC	*15. 8.85*	164(4)			176(4)
VK2AVZ	*28. 8.84*	252(4)			
VK2BCH	*13. 3.85*	204(1)			
VK2BQS	*22. 2.86*	160			165
VK2DPN	*12. 1.85*	244			
VK2DVU	*6.12.85*	150			
VK2PU	*10. 7.85*	163			
VK2SG	*20.12.85*			159(1)	
VK3AKK	*12. 1.85*		199(1)		
VK3CYL	*27. 8.84*	254(3)			254(3)
VK3DYL	*20. 2.85*	202			
VK3GB	*29. 1.85*	265(18)			
VK3VO	*14. 8.84*	193(14)			204(18)
VK4AIX	*19. 4.85*	165	131		189
VK4KS	*18. 1.86*		128(11)		
VK4OH	*27. 2.85*	196			
VK5AGX	*29. 4.85*		118		133
VK5ATN	*20. 6.84*	112			
VK5EE	*19. 2.85*	254			
VK5GZ	*30. 7.85*	102	116		140
VK5LC	*5. 3.86*	264(11)			
VK5PS	*19. 2.85*	200			
VK5WO	*4.12.85*		188(5)		
VK6DU	*11. 7.85*	186			
VK6RU	*1. 6.85*		269(42)		
VK8YF	*20. 6.84*	181			
VK7BC	*11. 7.85*		190(6)		

AWARDS ISSUED RECENTLY

WORKED ALL STATES (VHF) all 144 MHz

163 Michael Trickett VK3ASQ
164 Michael Goode VK3BDL
165 Trevor Niven VK5NC

WORKED ALL VK CALL AREAS (VHF) 52 MHz

27 Lionel Curling VK3NM

WORKED ALL VK CALL AREAS (HF)

1421 Flariano Moro I2MOV
1422 Pushkino Club Station UK3DAH
1423 Vladimir Korolev UA9OO
1424 G N Sozontov UA9HBA
1425 Mrtl UC1AWC
1426 A M Belovodsky UA0ICA
1427 A Vernigorov UA6AAQ
1428 Yuri Sarichev UH8EAD
1429 V W Pushkar UA6HEZ
1430 D N Rajskiy UW1AE
1431 Kiev Politeknik ARC UK5UDX
1432 Nick Gostry UB5UAT
1433 V F Miroshnichenko UA0LCZ
1434 Boris Z Rodin UA3ADY
1435 Valery Sopov UA0ZDE
1436 Tom V Stepanov UA6APP
1437 Mrii UK2ABC
1438 Arkady J Voloshin UA4CDC
1439 N J C Cox PA2NJC
1440 Eric Gullom YC8VCE
1441 Joe Schembri 9H1GY
1442 Jinichir Tanaka JK1MOC
1443 Fujio Satoh JH7DUM
1444 J H Over PA2JHO
1445 Lugia Raffaele IS0KNG
1446 Yoshi Kokubun JA7IKQ
1447 Seigo Kobayashi JE7BEX

HEARD ALL VK CALL AREAS

101 Fred Freemantle L40855
102 J Bearsby L60935
103 Frank Lindsay L30266
104 Kenichi Kobayashi JA1 9597
105
106 Pavlova Posad Club Station UK3 142 1700
107 Yuri Galurov UA4 152 361
108 Vladimir G Grushevsky UB5 059 11
109 Alex E Choglokov UA1 169 656

DXCC NEW MEMBERS

The following new DXCC members both have a score of 101.

341 Robert F Hancock VK5AFZ
342 Peter F Jeffery VK2APJ

FRANKSTON & MORNINGTON PENINSULA ARC 10TH ANNIVERSARY AWARD

1986 marks the 10th Anniversary of the Frankston and Mornington Peninsula Amateur Radio Club and to commemorate the occasion, a special award is being offered to all licenced amateurs.

To qualify for the Award, 10 FAMPARC members should be worked during the 12 month period between 27th February 1986 and 27th February 1987. Alternatively, the Club Station VK3BHU/P, should be worked on 17th or 18th May 1986 for a single qualifying contact.

Contacts may be made after the Club net which begins at 1000 UTC on Wednesday evenings, 3.570 MHz ± QRM. Watch for the Club Station, VK3BHU.

The cost of the Award is $A3 or equivalent and should be sent, together with log extracts to: *The Awards Manager, PO Box 38, Frankston, Vic. 3199.*

For a list of Club Members send a SASE to the above address.

BARTG AWARDS

Quarter Century Award

The Quarter Century Award is issued by the British Amateur Radio Teleprinter Group (BARTG) on the submission of satisfactory proof of two-way RTTY communication with 25 different countries. The Award is also available to SWLs on a *heard* basis.

Measuring 25.5 x 33 cm and printed in Red, Green and Black, the Certificate makes an attractive addition to the wall of any amateur radio shack. Endorsement stickers are available for each additional 25 countries up to a total of 200.

Application for the Award may be made by any of the following methods.

Submission of QSL cards for the countries being claimed. These cards are returned after checking. Alternatively, submission of photostats or photos of these QSL cards is acceptable (and preferred). Such copies should clearly show both call signs and should establish beyond doubt that the contact was made by two-way RTTY

Claims will also be accepted based on a check list containing call signs of stations worked, date, time of contact and band used. This list (and the QSL cards) are to be scrutinised by two officers of a recognised radio club or a national radio society. The signed check list and any fees are all that is required under this method.

Claims can also be accepted based on a contest log submitted for any RTTY contest sponsored by the BARTG. The claim should be made at the same time as the contest log is submitted.

NOTE: For the purpose of establishing Country Status, the ARRL DX Countries List is the standard reference in order to maintain compatibility with other groups with which BARTG may have reciprocal arrangements.

The cost of the Award is US$3 or 15 recent IRCs. Cost of extra stickers is three recent IRCs, plus five IRCs if QSL cards are to be returned.

Inquiries and claims for this Award should be directed to: *Ted Double G8CDW, 89 Linden Gardens, Enfield, Middlesex, England, EN1 4DX.*

VHF/UHF Century Award

In order to promote interest in RTTY on the VHF/UHF bands, the BARTG offer a range of operating awards, and these are available on the submission of satisfactory proof of having worked/heard the necessary number of different stations using RTTY as the mode of communication.

PLEASE NOTE: Extracts from station logs or samples of *hard copy* are not acceptable.

The Awards are available separately for three different bands, and the minimum number of contacts on each band are as follows.

144 MHz band ... 100 different stations worked or heard.

432 MHz band ... 50 different stations worked or heard.

1296 MHz band ... 10 different stations worked or heard.

Additional stickers are available for each additional 25 stations worked up to a total of 200. On the 1296 band endorsements will go up in steps of 10.

Application for the Award may be made by any of the following methods.

Submission of a check list of OSL cards held, listing, call sign, date and time of contact and report received. The Awards Manager will make a random selection from this list and will ask to see those cards which will be returned with the Award.

Claims will also be accepted based on a check list as above, but which has been witnessed (together with the QSL cards) and signed as correct by two officers of a recognised radio club or national radio society.

Claims can also be accepted based on a contest log submitted for any VHF/UHF RTTY Contest sponsored by the BARTG. The claim for the Award should be made at the same time as the contest log is submitted.

Cost of the Award will depend on postal rates in force at the time, but a quotation is available on request.

Claims should be posted to *Ted Double G8CDW*, as above.

This information has been kindly supplied by Jim Swan VK2BQS.

THE 10th ASIAN GAMES AWARD

This Award, sponsored by the Korean Amateur Radio League Inc (KARL), is to commemorate the 10th Asian Games which will be held in Seoul from 20th September 1986 to 5th October 1986. The following special awards program will be available to all amateurs and SWLs world-wide.

The following classes of awards are available to all amateurs and SWLs who receive QSL cards during the period 1st January 1986 to 5th October 1986, complying with the rules specified.

Class HL is issued to those stations who made contact/heard 10 HL stations including at least one HL1 (Seoul) station.

Class DX is issued to those stations who made contact/heard 10 countries participating in the Asian Games, including one HL station. In this case, the *number of contacts* made/heard with/from one's own country will not be counted.

The special station, HL86AG is planned to be operational during the period of the Games, and QSL cards received from this station will count as equivalent to five HL stations, or five participating stations, whichever is applicable.

To apply for the Awards send GCR and W 2 000 or US$4 or 10 IRCs per Award.

Applications must be received prior to 20th September 1987. KARL will commence issuing Awards from 20th September 1986.

Extra prizes, such as commemorative stamps or Asian Games Mascots will be issued to the Award winners.

The design of the Award will be based on the official poster of the 10th Asian Games.

For reference, the prefixes of call signs of the 36 member countries of the Games are as below:
A4; A5; A6; A7; A9; AP; BY; DU; EP; HM; HS; HZ; JA; JT; JY; OD; S2; V8; VS6; VU; XV; XW; XZ; YA; YB; Yi; YK; 4S; 4W; 7O; 8Q; 9K; 9M; 9N; 9V; HL.

Applications should be forwarded to: *Korean Amateur Radio League, GPO Box 162, Seoul 100, Korea.*

AR

AMSAT Australia

Colin Hurst VK5Hi
8 Arndell Road, Salisbury Park, SA. 5109

OSCAR-10 APOGEES
M A Y 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
0th May										
120	2194	2313:19	-25	196	55	73	73	62	93	41
1st May										
121	2196	2232:22	-25	187	71	65	82	53	98	32
2nd May										
122	2198	2151:26	-25	177	80	56	88	44	102	24
3rd May										
123	2200	2110:29	-25	168	87	47	93	36	106	15
4th May										
124	2201	0850:01	-25	343					244	-3
124	2202	2029:32	-25	158	92	39	98	27	110	7
5th May										
125	2203	0809:04	-25	334					249	5
125	2204	1948:35	-25	149	97	30	102	19	114	-0
6th May										
126	2205	0728:07	-25	324					253	12
126	2206	1907:39	-25	140	101	22	107	12		
7th May										
127	2207	0647:11	-25	315			247	2	257	20
127	2208	1826:42	-25	130	106	14	111	4		
8th May										
128	2209	0606:13	-25	305	246	-0	252	10	261	29
128	2210	1745:46	-25	121	110	6				
9th May										
129	2211	0525:17	-25	296	250	7	257	18	265	37
129	2212	1704:48	-25	111	115	-1				
10th May										
130	2213	0444:20	-25	287	255	15	261	26	270	46
11th May										
131	2215	0403:23	-25	277	259	23	266	34	276	55
12th May										
132	2217	0322:26	-25	268	264	31	271	42	284	64
13th May										
133	2219	0241:30	-25	258	269	39	278	51	297	73
14th May										
134	2221	0200:33	-25	249	274	48	286	60	329	80
15th May										
135	2223	0119:36	-24	240	281	57	298	68	30	80
16th May										
136	2225	0038:39	-24	230	291	66	321	75	62	73
136	2227	2357:43	-24	221	309	73	4	78	76	64
17th May										
137	2229	2316:45	-24	211	346	78	43	74	84	55
18th May										
138	2231	2235:49	-24	202	34	77	64	67	89	46
19th May										
139	2233	2154:52	-24	193	60	70	75	58	94	37
20th May										
140	2235	2113:56	-24	183	73	61	83	50	98	29
21st May										
141	2237	2032:58	-24	174	82	53	89	41	102	20
22nd May										
142	2239	1952:02	-24	164	88	44	94	32	106	12
23rd May										
143	2240	0731:34	-24	340					247	-1
143	2241	1911:05	-24	155	93	35	99	24	110	4
24th May										
144	2242	0650:38	-24	330					251	7
144	2243	1830:09	-24	145	98	27	103	16		
25th May										
145	2244	0609:40	-24	321			245	-2	255	15
145	2245	1749:11	-24	136	102	19	108	8		
26th May										
146	2246	0528:44	-24	311			250	5	259	23
146	2247	1708:15	-24	127	106	11	112	1		
27th May										
147	2248	0447:47	-24	302	248	2	255	12	264	31
147	2249	1627:18	-24	117	111	3				
28th May										
148	2250	0406:50	-24	293	253	9	259	20	268	40

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685MHz — Summer: 7.064MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

Unfortunately, due to unforeseen circumstances, AMSAT notes did not arrive in time for publication this month. Therefore there will be a double issue next month.

NOTES OF SATELLITE ACTIVITY

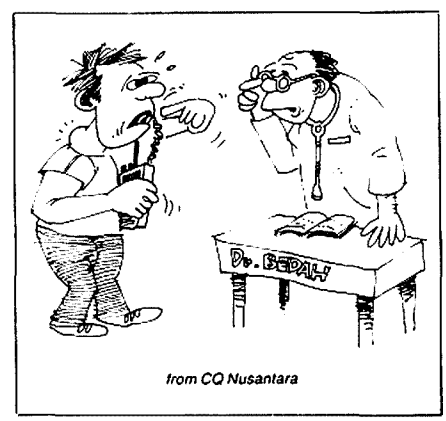
1 STS-61C was launched from Kennedy Space Centre utilising Shuttle Vehicle *Columbia*. Orbital elements were apogee 350 km, perigee 327 km, inclination 28.5° and period 91.3 minutes. On board were R L Gibson, C F Bolden, F R Chang-Diaz, G D Nelson, S A Hawley, R J Cenker and C W Nelson.

The payload included Satcom KU-1/PAM-D2, Material Science Lab-2 (MSL-2), Hitchhiker G-1 (HHG-1), GAS Bridge Assembly (Includes 12 GAS cans), Getaway Special (G-470), Infrared Imaging Experiment (IR-1E), Initial Blood Storage Experiment (IBSE), Comet Halley Active Monitoring Program (CHAMP) and Shuttle Student Involvement Program (SSIP).

2 Satcom KU-1 had elements apogee 35488 km, perigee 348 km, inclination 27.0° and period 628.4 minutes.

RETURNS
During the period 39 objects decayed, including the following satellites:

1982-115A	Cosmos 1423	18 Jan
1985-120A	Cosmos 1713	22 Jan
1986-001A	Cosmos 1715	22 Jan
1986-003A	STS-61C	18 Jan



from CQ Nusantara

29th May										
149	2252	Ø325:53	-24	283	257	17	264	28	273	49
30th May										
150	2254	Ø244:57	-24	274	262	25	269	36	280	58
31st May										
151	2256	Ø204:00	-24	264	267	34	275	45	290	67

OSCAR-10 APOGEES
JUNE 1986

			SATELLITE		I----------BEAM HEADINGS----------I					
		APOGEE	CO-ORDINATES		SYDNEY		ADELAIDE		PERTH	
DAY #	ORBIT #	U.T.C HHMM:SS	LAT DEG	LON DEG	AZ DEG	EL DEG	AZ DEG	EL DEG	AZ DEG	EL DEG
1st June										
152	2258	Ø123:Ø3	-24	255	272	42	282	54	3Ø9	75
2nd June										
153	2260	ØØ42:Ø6	-24	246	278	51	292	62	351	8Ø
3rd June										
154	2262	ØØØ1:1Ø	-24	236	286	6Ø	3Ø7	7Ø	42	77
154	2264	2320:12	-23	227	299	68	336	76	65	69
4th June										
155	2266	2239:16	-23	217	322	75	19	76	77	61
5th June										
156	2268	2158:19	-23	2Ø8	4	78	5Ø	71	84	51
6th June										
157	227Ø	2117:23	-23	199	43	74	66	63	9Ø	43
7th June										
158	2272	2Ø36:25	-23	189	63	66	76	55	94	34
8th June										
159	2274	1955:29	-23	18Ø	75	58	84	46	99	25
9th June										
16Ø	2276	1914:32	-23	17Ø	83	49	9Ø	37	1Ø3	17
1Øth June										
161	2278	1833:36	-23	161	88	4Ø	95	29	1Ø7	9
11th June										
162	2279	Ø613:Ø7	-23	336					249	2
162	228Ø	1752:38	-23	152	94	32	99	21	111	1
12th June										
163	2281	Ø532:1Ø	-23	327					254	9
163	2282	1711:42	-23	142	98	23	1Ø4	13		
13th June										
164	2283	Ø451:14	-23	317			248	-1	258	17
164	2284	163Ø:45	-23	133	1Ø3	15	1Ø9	5		
14th June										
165	2285	Ø41Ø:16	-23	3Ø8			253	7	262	25
165	2286	1549:49	-23	123	1Ø7	7	113	-2		

SATELLITE ACTIVITY FOR PERIOD 8 TO 28 JANUARY 1986.

1. LAUNCHES.

The following launching announcements have been received:-

1986-001A	Cosmos 1715	Jan 8	USSR
002A	Cosmos 1716	Jan 9	USSR
002B	Cosmos 1717	Jan 9	USSR
002C	Cosmos 1718	Jan 9	USSR
002D	Cosmos 1719	Jan 9	USSR
002E	Cosmos 1720	Jan 9	USSR
002F	Cosmos 1721	Jan 9	USSR
002G	Cosmos 1722	Jan 9	USSR
002H	Cosmos 1723	Jan 9	USSR
003A	STS-61C	Jan 12	USA
003B	Satcom KU-1	Jan 12	USA
004A	Cosmos 1724	Jan 15	USSR
005A	Cosmos 1725	Jan 17	USSR
006A	Cosmos 1726	Jan 17	USSR
007A	Raduga 18	Jan 17	USSR
008A	Cosmos 1727	Jan 23	USSR
009A	Cosmos 1728	Jan 28	USSR

QSP

FIRST COMPUTER

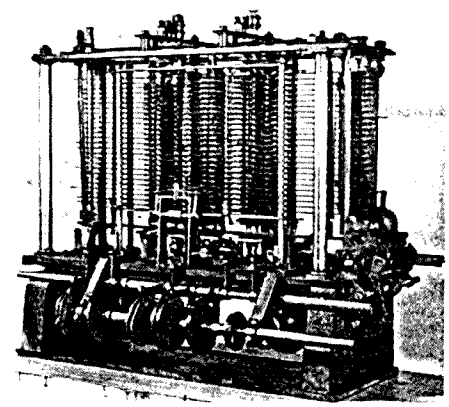
Charles Babbage is credited with building the first computer. *When?* In 1833, over 150 years ago.

A university, he avoided mathematics classes, preferring to row a boat on a nearby lake — and think. Yet, in spite of this truancy, his academic achievements were brilliant. In 1812, at the age of 21, he devised the first wholly automatic calculating machine. Among his other *firsts* was disco-style lighting. Subsequently, he was made a Member of the Royal Historical Society.

After 15 years of cogitating on how to invent a machine with the ability to produce the answers to complex mathematical problem quickly, Babbage came up with a bulky mechanical contraption of cogs, gears, wheels, etc called the *analytic engine.* The general opinion of the day was that it almost worked — almost but not quite; however, it was the basis of the first computer.

A progression of this mechanical computer was the development of the punch card system — a method of instant recall of information from files ad other tabulations. Pre-WWII, OOTers may remember it. It is recorded that one of the earliest programmers was Lord Byron's daughter Augusta, who compiled mathematical programs for Babbage's projected *analytic engine.*

Contributed by Alan Shawsmith VK4SS



Charles Babbage, who in 1812 at the age of 21 devised the first wholly automatic calculating machine, proposed a much more ambitious machine in 1833 — the "analytic engine". This was the basis of the modern computer.

FIRST ELECTRONIC COMPUTER

Soon after the appearance of the vacuum tube, an attempt was made in the late 1920s to create the first electronic computer capable of accepting simple instructions. The rack and panel monster — weighing a ton — almost filled a large room and contained 10 000 bulky tubes. It was cooled by fans placed in every possible space; even then it overheated. An adjoining room housed the power supplies and a team of several maintenance men and operators was needed to keep it functioning.

Today, thanks to technological progress, ie solid state miniaturisation, multi-bit chips, etc, a computer of infinitely greater capacity can be carried easily in a coat pocket.

Contributed by Alan Shawsmith VK4SS

Coming next month —

Equipment Review of

KDK FM-240 Two-metre FM

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

MRS FLORENCE VIOLET McKENZIE OBE

Who was Mrs McKenzie?

This question is often asked by new members to our ranks when they see her name perpetuated, particularly with regard to the *Mrs Florence McKenzie CW. Trophy* awarded annually to the Australian YL operator with the highest CW score in the ALARA Contest.

This beautiful trophy, donated by the Townsville Amateur Radio Club, is a fitting *memorial* to a lady who contributed so much.

Mrs McKenzie (nee Wallace), had many *firsts* to her credit, among them the first Australian qualified woman electrical engineer; first licenced YL amateur radio operator with the call sign 2GA, later VK2FV; first woman member of the WIA.

Her main claim to fame, however, came during World War II, when she was responsible for training thousands of service men and women in telegraphy and communication skills. She also played a major role in the formation of the Women's Emergency Signalling Corps.

For her services, she was awarded the Order of the British Empire (OBE) after the war.

The following remembrances of *Vi Wallace* (Mrs McKenzie), were received from a VK2 OM, and give some interesting recollections of a truly remarkable lady, who was an inspiration to us all.

VALE VI WALLACE

Many amateurs fondly remember Mrs McKenzie, with memories going back to World War II. Some knew her because she conducted Morse Schools and some remember her radio store, in a little arcade. Seeing her in a nursing home a few months before her death caused a lump to rise in my throat, for I had not seen her since the war. At that time, as a budding blue orchid, I learned CW at her wartime school, but my memory goes back further. My own grandfather was a builder from Jersey, and Vi Wallace, the licenced electrician, was a friend of the family. In particular, she was a friend of Aunt Caroline (who recently passed away at the age of 93). Both belonged to that elite class known as *Garvie's Gels* of Sydney Girls' High, then situated in Elizabeth Street, opposite Hyde Park.

As Australia's first licenced female electrician, Vi clambered over and under roofs to install electrical wiring. Granddad did all his trades in Jersey and abominated the new fangled electricity — he was brought up on gaslight. Those early days, were the days of two-pin plugs. Earthing was almost unknown.

My first recollection of Vi was through the eyes of a six-year-old, way back in about 1924 — I cannot remember precisely. Those were exciting years of radio, when my own father, although not an amateur, made home-brew receivers. I assisted by holding down wire so that he could wind honeycomb inductances and large tuning coils surmounted by crystal and catswhisker.

Probably because of his fondness for oysters, he constructed batteries (with my assistance) out of oyster bottles, cutting glass dividers, moulding plates, applying lead peroxide and adding the acid. After that, the battery was connected to an eliminator (Trickle charger?) and we were in business.

I remember visiting Vi's shop with him in the arcade on occasions when she explained a circuit in layman's terms. Very little theory was discussed beyond where to solder the wires.

In spite of many visits to the shop, Vi was unable to assist in eliminating the unfortunate squeals from afar when someone was tuning in his regenerative receiver. Some listeners derived malicious satisfaction in jumping up and furiously twisting their own tuning knob back and forth.

We often remember people from that last photograph — that last meeting. But age is not kind and most wish to be remembered as bright, energetic — eternal youth.

The accompanying photographs are from my photo junk-box. One was inscribed *With love from Violet Wallace 4th September 1942.* There is no record of the date of the second, which was taken on a very important day of her life. For my part, I shall always remember her as Vi Wallace.

NEW MEMBER

We would like to extend a welcome to Jan VK2CJN, whose joining date was 8th March. Jan has recently upgraded to full amateur status. Congratulations Jan!

Congratulations also to Bron VK3DYF, ex-VK3NTD. I am sure she will make good use of the new call sign.

SILENT KEY

On a sad note, we were all saddened to hear that Hisako JJ1LQI, has become a Silent Key. Hisako was an ALARA member, sponsored by Wendy VK4BSQ, and passed away suddenly on 5th February. Our condolences to her husband Sadao, daughter Hiroka and son Kentaro.

Thanks to Bill VK2NXT, for this information.

That is all for this month. See you next time — 73/33 Joy.

AR

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER

56 Baden Powell Drive, Frankston, Vic. 3199

To start with, I would like to thank those who have responded to the requests for opinions about examination matters, published in February AR. A pleasing number of letters was received, and other opinions were delivered personally or on-air. More comments in response to this article will, of course, be acceptable.

To summarise so far:

Question 1 — about the relative standards of NAOCP and AOCP theory examinations.

Only a few letters were received from candidates who attempted both levels on the same day, but these generally were satisfied with the standards, and the difference in level between the two.

I do not yet have the results of DOC's investigations, but have heard of only one case where a candidate passed AOCP and failed NAOCP.

Question 2 — opinions about the term Novice.

Only a few respondents felt that the term Novice is derogatory. Many commented that it is an accurate description of most operators for their early days on-air, but some were hesitant in applying the term to older, more experienced operators when they themselves were newcomers. Several suggested the use of Class 1, Class 2, etc as an alternative. One correspondent took more exception to Full Licence.

Question 3 — ideas about a single paper with different pass levels.

This question caused most comment, as it has on most occasions when it has been raised. There were nearly as many suggestions about how to handle it as comments on the idea, but the general opinion was in favour, because of the recent increase in examination fees.

This suggestion has been around for some years, but so far no simple and efficient mechanism has been proposed. The difficulty is again with the standards and balance of levels.

By the time you read this, our Study Guide for the Novice Course should be available, or very nearly so. I will be interested to receive comments at any time, but especially from those who use it as the basis for a class or course. Please take the time to jot down any ideas that arise on each section, and send then to me, so that we can reassess it at the end of a year of use.

Best wishes to all those sitting for any examinations this month.

73 — Brenda VK3KT.

AR

Radio Amateur Old Timers Club

REPORT OF RAOTC DINNER

Kevin Duff VK3CV
RAOTC PUBLICITY OFFICER

The Radio Old Timers Club held its dinner and Annual General Meeting at the City and Overseas Club, on 6th March. It was a very hot day for Melbourne, over 40 deg C or 100 deg F.
Members decided, despite the air-conditioning, to remove coats and jackets and the dinner was under-way.

Max Hull VK3ZS, was Master of Ceremonies to the 41 members present. Apologies were received from Roy Perry VK3OU; Murray Clyne VK3HZ; Ivan Hodder VK3RH; John Fullager VK3AVY; Peter Thornley VK3DSU; Len Grey VK2AKO; Lloyd Chappell VK7LC; Eddy Burne VK7GB; Charles Nelson VK3WC; Ron Higginbotham VK3RN and Arch Woolnough VK3BW.

Members were very pleased to welcome *No1* VK3BWQ, to the dinner. He is a RAOTC member, but spends most of his time in Holland, where he is Treasurer of the Dutch Old Timer's Club. His call sign in Holland is PA0NOL and he hopes that when he returns to Europe he will be able to contact many of his Australian friends.

The guest speaker and presenter for the evening was Chris Long, well-known for his research into early recording techniques, the beginnings of broadcasting, early television and many other electronic subjects. He reminded us that it is now 30 years since television broadcasts began In Australia, 50 years since the first public broadcasting of television in Britain and 60 years since Baird gave his first demonstrations of live television. Chris' audio-visual display depicted the early transmissions of still and moving pictures by electrical means.

There were demonstrations of very early French facsimile pictures transmitted over telegraph lines, in 1863. Two Australians, Taylor and Wilkinson transmitted FAX pictures by radio in 1910 and may have been the first in the world to do this; however these were only still pictures.

With the advent of the rotating Nipkow disc, with its scanning holes and the use of the photo-electric cell, primitive moving pictures could be produced. The use of the new radio valves would show the way ahead. A young Australian, Donald McDonald was one of 3AR's first engineers and in 1926 was sent to America on a fact-finding tour, investigating the latest developments in radio. There he discovered that experiments were being made with television in that country and he brought pieces of equipment, circuits and ideas about the construction of television transmitters and receivers back to Australia when he returned.

In 1927, McDonald floated a company in Melbourne called *Television and Radio Laboratories Pty Ltd*, about the same time as John Logie Baird was forming his company in Britain. Both were using Nipkow discs for transmission and reception.

In 1928, McDonald hired, as his chief engineer, Gilbert Myles VK3KQ, pioneer of amateur radio, who later held the call sign VK2KI. Gil was responsible for the electric and electronic design of the equipment, both transmitters and receivers. On 10th January 1929, they commenced transmissions of both facsimile and 30-line television on Broadcast Radio Station 3UZ. These video programs were put to air after the station had closed it's normal transmissions and went for about 30 minutes, two nights per week for about six months.

Australian engineers had very advanced ideas in the television field, and Robert Strange took out a patent for producing stereo pictures using interlaced fields. Another Australian patent included a master synchronous pulse generator to drive the cameras and receivers in synchronism. These were very clever ideas for their time. The AWA company was experimenting with the facsimile method of transmitting pictures and in 1929, sent still photographs to England, by wireless.

In 1925, John Logie Baird was giving demonstrations of his television system in London and this had the great advantage that real objects, faces, etc could be transmitted without the use of film. Late in 1926, Baird began to transmit live pictures on station 2TV and that is where it all started.

From 1929 to 1935, the BBC transmitted programs using the Baird 30-line system. In Australia, in the early 30s, most of the local experimental transmissions were made by enthusiastic amateurs and the PMG allocated a channel on 2.200 MHz for this *purpose*.

Baird spent almost a year in Australia in 1938, as a guest of the IRE during the World Radio Convention. He brought with him a large amount of television equipment of the high definition type, including receivers using cathode ray tubes. Most of the teething problems of high definition television were now overcome. The era of mechanical television was fading fast.

Is there any use for mechanical television now? Chris thinks that there certainly is. In response to an article in Wireless World in 1972, several like-minded experimenters were discovered and as a result the Narrow Band Television Association was formed in Britain. It now has produced a quarterly magazine for the last 10 years. If any readers are interested in putting Narrow Band Television to air, you could phone Chris on (03) 82 1688.

Our President, Max VK3ZS, thanked Chris for his splendid presentation about the birth of television, which everyone enjoyed. He then spoke of our long-time Secretary/Treasurer, Harry Cliff VK3HC, who has now retired from the position after a decade of work, looking after our Club. Harry was presented with a fine pen to keep his log book up-to-date. Harry thanked the gathering for his gift and good wishes and suggested that his successor, Harold Hepburn VK3AFQ, would have no problems because the Committee was always ready to help. Harold was welcomed to his new position.

Net Controller, Lay Cranch VK3CF, is, after being at the *sharp end* of the monthly net for a very long time, passing on his duties to Mac McConnell VK3RV. Lay thanked the net liaison officers and controllers for the assistance that they have given him in the past and he felt sure that this would continue with Mac in the chair. Lay concluded by saying that the people he had worked with are *"The grandest bunch of blokes that a lifetime has produced"*.

Harold VK3AFQ, then spoke about funds and thanked all members who have sent donations to help our magazine to be published and forwarded.

Also, Bob Cunningham VK3ML, spoke about the lack of feedback received about the OTN Journal.

Other things discussed were — *do members want two Luncheons per year and not have a Dinner? Where are our younger members?*

Bob suggested that a lot more communication from members, to the Committee, would help shape the directions of the Club.

ELECTION OF RAOTC COMMITTEE

The present Committee opted to stay in office for the next year if required and as there were no other nominations, the present Committee was re-elected for the next 12 months.

The AGM then concluded.

AR

THANKS, WIRELESS INSTITUTE

Harry Atkinson VK6WZ
5/97 Railway Parade, Mount Lawley, WA. 6050

"Thanks and appreciation for the valued assistance of Institute members in providing communication within seven minutes of our request."

This was the gist of a letter received recently by the Secretary of the WA Division. It was written by Mr C C Ainsworth, Co-ordinator of the State Emergency Service, Kalamunda squad, following a serious bushfire in the district at the end of January.

The emergency repeater, VK6**REE**, was activated and put at the exclusive disposal of the Emergency Service for bushfire communications and it was the speed with which this was done that prompted the letter from Mr Ainsworth. With the close liaison which exists between all fire-fighting groups in Western Australia, and local government, this sort of co-operation can only further the cause of amateur radio.

Mr Ainsworth made the further point that several of the SES members in the Kalamunda/Gosnells Emergency Service were amateur radio operators.

It is up to all members and all Divisions to make the most of these instances of co-operation and goodwill between local government, bushfire brigades, civil defence and other bodies, both paid and voluntary on the one hand, and the amateur radio service on the other. By carefully, calmly and factually making details known to the media and general public, we can all do our part towards improving our hobby's image in the minds of neighbours and civic authorities.

It may give us some short-term satisfaction to rub someone's nose in the dirt by quoting a legal decision in the matter of Bumbletown City Council versus Joe, a licensed amateur who was given the go ahead to erect his tower and the civic fathers were ordered to pay his legal costs as well as their own . . . but it is much nicer if we can let civic authorities know what decent citizens we are . . . and allow them to make up their own minds about the value of our hobby to the community at large.

By all means collect all the facts you can on privately-owned trees that drop branches on neighbour's houses or garages . . . on dog breeders whose activities disturb the peace . . . on pigeon-fanciers whose winged messengers keep you awake with their noise and whose sanitary habits despoil your home . . . by all means compile a dossier on these things lest, one day, you need a lawyer to plead your cause in court to have the right to peacefully and without risk to neighbours, pursue your hobby.

But remember, it always is much better to prove you (and your hobby) are right, rather than prove some city council wrong. There is a difference. Being told in open court that you are wrong leaves a nasty feeling; discovering that some amateur who wants to erect a properly engineered safe mast or tower is a *good* citizen makes you (the civic authority) feel good — especially if you find out this amazing fact without being taken to courtIpe *Written by Harry Atkinson VK6WZ, on behalf of the WA Division of the WIA.*

AR

A R Showcase

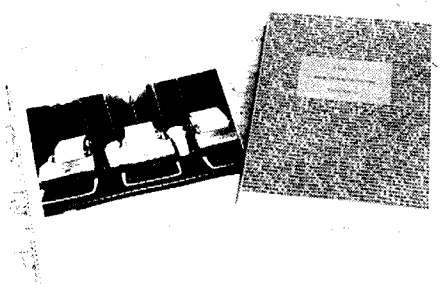
FREQUENCY LISTS FOR SWLs

Two new publications, designed to provide the SWL with all those unknown frequencies at their fingertips, are now available.

The first, is by well-known German author Klingenfuss. *Guide to Utility Stations* is a soft bound book containing 465 pages of frequency users, their operating schedules, modes of operation (SSB, RTTY, FEC, ARQ, FA) over a frequency range of 0 to 150 kHz and 1.6 to 30 MHz.

An added bonus to the purchaser of Guide to Utility Stations is the 12th edition of *Guide to RTTY Stations. The combination lists over 1500 frequency users including, amongst others 80 RTTY Press Services, along with 502 of their frequencies. As a further bonus, three large fold-out maps show various areas and the frequencies used within them, by the Aeronautical Services over different parts of the globe.*

Guide to Utility Stations is available from GFS Electronic Imports for $45 plus $5 postage and packaging — catalogue no UG-86.



The second publication is by Michael Schaay, a highly respected Dutch author, who has gained his reputation through a number of well received previous listings. Known as the *Radioteletype Press Broadcast Time/Order List* it is ideal for those interested in monitoring the world's press services.

Its easy to follow layout lists of 56 different agencies in Time Order, a total of 1500 entries. For those interested in a particular Press Agency the Radioteletype Press Broadcast Time/Order List also contains a Time/Frequency schedule for each agency. Price is $25 plus p&p, catalogue no RTPB.

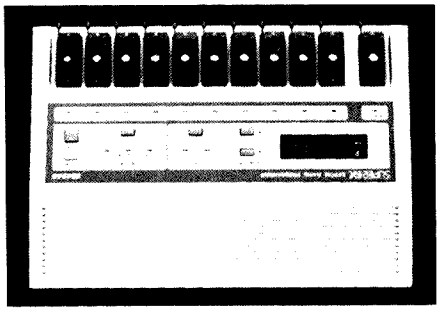
Further information may be obtained from GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone (03) 873 3777.

AR

INTELLIGENT GANG PROGRAMMER

Similar to the SE-4948 intelligent portable programmer, the new SE-4948 intelligent gang programmer from Alfatron sets new standards in the high speed production of programmed PROM devices. Featuring the new authorised algorithms, programming times are reduced to at least a quarter of the conventional method and in most cases much more.

PROM devices from 16 kbits to 512 kbits are supported. Most popular EEPROMs are also covered. Programming voltages are determined according to the device type and may vary between five volts up to 25 volts as required. A large LED numeric display indicates device type and programming algorithm employed. Naturally a check sum is also displayed. For devices with automatic identification capability setting up is done automatically.



The SE-4948 automatically programs 10 devices simultaneously and has extensive checking features to allow even a relatively unskilled operator to use the machine without danger of damaging costly devices. The SE-4948 already has approval numbers from several semiconductor manufacturers.

For further information contact Alfatron on telephone (03) 758 9000.

AR

AMATEUR RADIO TOUR

The Israeli Radio Amateur Club invites amateurs to participate in a 10 day tour of Israel. Special highlights of the tour will be *transmitting from the Holy City and the Dead Sea, the lowest point on earth, meeting with Israeli radio amateurs, and participate in a tree-planting ceremony at the Silent Key Forest. Licenses will be provided free of charge by the Ministry of Communication to all licensed amateurs of general class and upward.*

ORTRA

The tour is from 5th to 14th July 1986.

Further information about this tour, or future tours may be obtained from Zvi Gelfand, Managing Director, Ortra Ltd, 2 Kaufman Street, PO Box 50432, Tel-Aviv 61 500. Mr Gelfand would be happy to plan an itinerary for a group or organisation to take a similar tour should the above not suit the requirements of participants.

AR

QSP

TESTS OF ELECTRONIC COMPONENTS

Climatic tests are use to improve the quality and reliability of electronic components and assemblies. Qualifying test determine the suitability if a component for a given application.

A qualifying test comprises three phases — characterising (electrical); environmental testing and detecting premature failures and determining failure rate.

Environmental testing methods employed in the second and third stages are often the same, however, the object in the second phase is different from that in the third.

Whilst electronic components are destructively tested to the limits of their servicability in the second phase, they are only tested within permissible limits in the third phase so that premature failure can be detected.

Testing methods are high temperature storage, burn-in, temperature cycling and humidity testing.

High temperature storage is a test performed with passive test specimens and is part of a pretreatment to stabilise the electrical and mechanical parameters. It is compared to *malleabilising* in metallurgy.

Temperatures of up to +200 degrees Celsius are used. The success of this test in detecting premature failures is minimal (5-10 percent), but it is relatively high in the case of EPROMS.

Burn-in combines high temperature storage and electrical operation of the components with the objective of accelerating the occurrence of premature failure. About 50-70 percent of potential premature failures are induced by burn-in. Burn-in is carried out primarily in the temperature range between +125-+150 degrees Celsius. Oxidation can occur on the contact pins at this heat and have a detrimental effect on solderability.

Temperature cycling demotes tests in which the specimens are subjected to rapid changes of ambient air temperature in the order of at least 50 degrees Celsius per minute. Although the test is thermal, the effects on the structure of the components are mechanical. Different thermal conductivities and coefficients of expansion of the materials used produce mechanical stresses which destroy weak points in the structure.

Most commonly used test chambers have two different compartments with a cradle lift system which enables the test specimens to be transferred directly from a hot compartment to a cold one.

The liquid thermal shock test is particularly severe. The test specimen is immersed alternately in cold and hot liquids, and is used mainly for semi-conductor components.

Humidity tests under steady-state conditions are destructive and used only in qualifying tests.

The diffusion of water vapour through the plastic materials of housings is a process which causes internal corrosion and thus limits the useful life of integrated circuits.

The 85/85 test is a comparative test for identical types of components. High humidity, combined with high air temperature (+85 degrees Celsius/ 85 percent relative humidity), ensures a high diffusion rate. The test is usually performed with active test specimens. Testing time is measured in which 10 or 50 percent of a batch fails and the results are used as reference values for the quality of the plastic housing and the passivation process.

Compared with the failure rate of other components, the failure rate of semi-conductors is not significant. However, the situation is different in the case of highly complex assemblies. A 100 percent test on electronic assemblies, including trouble shooting and repair is extremely expensive. As a result, a combination of pretreatment and random testing of assemblies is becoming popular.

Condensed from Electronics News — February 1986

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

At the time of my stay on Morotai Island, there were an estimated 10 000 troops there, Americans, Indians and Australians. Prior to when the Australian Army Amenities Medium Wave Broadcaster, 9AD, came on air there had been several other broadcast stations. The main one was WVTL, a station which was constructed mostly of junk parts by Australian and American signalers, and operated by a unit called the 96th American Division, I believe.

BROADCAST LIVE

WVTL often relayed news from Radio Australia for the Australians, and San Francisco KGEI (there was no Voice of America then) for the Americans. There was always trouble with the WVTL transmitters — they always had induced hum on them, a problem which was never fully rectified and one which the listeners had to get used to.

After the surrender of Japan, General Blamey participated in ceremonies on Morotai Island. These ceremonies were held on an open area of land, ringed by members of all the forces who had fought in the war. WVTL attended with an outside broadcast unit and broadcast the proceedings live to the island. The ceremonies involved a surrender document being signed.

Some weeks later, WVTL closed down as the Americans prepared to return to their homeland, and a ship off the shore began broadcasting on the medium wave band. All announcements for the shipborne broadcasters had to be delivered to them by boat. These consisted mainly of announcements for concert parties and film shows on the island. However, this station was not on air very long before 9AD began transmitting.

At the end of the war in the Pacific, there were many enemy POWs on the island awaiting the war trials. They often did many of the menial tasks around the camp.

One day, I was asked to be present at one of the war trials to represent our unit. The defendant had killed many unidentified allied POWs on a nearby island. When he was asked how he felt when he was told by his senior officer to kill, he said that as a soldier of his army he was supposed to obey his superior officers without question.

I mention these matters because they were part of my stay on Morotai and war is tough. I can only write the story as I saw it.

I was present on Morotai when our prisoners were released from POW camps. Many were brought to Morotai where they received medical treatment before returning to Australia. Many were skin and bone and I shall never forget the sight of them - mere skeletons.

Before joining the Broadcasting Unit, 9AD, I was at the camp we had established after landing on Morotai (see a previous *Listening Around*).

My mate was a chap named Darcy Tanner, and I had worked with Darcy on the staff of the Sydney Daily Telegraph prior to our being called-up for service in the Army. Darcy and I decided what the camp needed was a news-sheet and, being formerly employed by a newspaper, we decided to do something about it.

OUR OWN LITTLE NEWSPAPER

I had a typewriter but we had no paper and where else better to get supplies but our former employer in Sydney. A letter was duly sent to the personnel manager of the Daily Telegraph. He in turn promptly sent us enough paper to keep us going for quite some time.

Darcy had a gift for writing poetry so whilst he wrote verse, I gathered the news by radio from a receiver that was in the Salvation Army Officers hut. We then printed it out on sheets, about A4 size, and posted them up on bill-boards throughout the camp. Also, as I had helped to install the camp's amplifying system, I was given permission to use the system from the Orderly Room when I had anything resembling a "scoop" from an overseas source.

IN TROUBLE FOR THAT

One day, as I was listening to San Francisco KGEI, I heard a broadcaster speaking from Paris stating that *the French people do not know of the surrender in Europe.* What surrender, I thought as we had heard nothing of it either. A short time later the news came to hand that the Germans in Europe had surrendered. The end of the war in Europe had come!

I raced out of the hut and up to the Orderly's Room where I grabbed the microphone, called everyone to attention and told them that the war in Europe was over. Even in the Orderly's Room I could hear the shouts of the hundreds of soldiers who had heard my announcement. It was unbelievable.

When I got back to the hut several officers confronted me saying *"You are putting over misleading information, you will be in trouble for that".* I attempted to reassure them that I had only broadcast what I had heard, but they were not convinced.

I told them to be sure to attend one of the American Army's film shows that night. These shows were always well attended and the main film was usually preceded by a news broadcast from the Bio Box, in which all the news of the day was given. (My friend Darcy was later drowned at sea).

After leaving 9AD, I joined an army newspaper unit called *Table Tops*. This paper had earlier been formed in Queensland. My job with this unit was similar to the one I had in Sydney prior to joining the Army. At *Table Tops* I had the use of about half-a-dozen receiving sets, each of which was usually used to monitor stations like the BBC, KGEI, or others that broadcast world news. My assignment was to gather news from any source. Not being able to write shorthand, I was confined to making rough notes of what I heard and copying anything I heard in CW from world newsagencies. There were also two shorthand reporters who had a Number 11 set on which they could listen to the main news broadcasts.

From the hut where I listened I could see the giant screen of the Australian Army's Boomerang theatre where thousands of troops, each equipped with his own water bottle, ground sheet and box to sit on, watched the show. I had sought and obtained permission to erect a simple telephone between the giant loudspeaker at the back of the screen, a battery and headphones so I could hear the sound of the film from my listening post.

OUT OF ORDER

Now let me tell you, completely out of chronological order (as my close friends know, I am not of a methodical nature), about some of the incidents concerning the Boomerang theatre. While I was still at 9AD, we were friends with three Indonesian natives who were employed mainly to wash our clothes. They had a tent just outside our area with a loudspeaker especially installed for them by the 9AD technician. This was connected to a dual-wave radio so they could hear Indonesian dance music and news broadcasts from Radio Australia in Indonesian.

The three Indonesians were 17, 16 and 11 years of age, and it was often our custom to take them along to the Boomerang theatre, a treat which they enjoyed very much. It was, however, forbidden for anyone other than troops to attend so we used to dress them up in pieces of Australian Army uniforms and smuggle them in, warning them not to speak. If they spoke they could be immediately recognised and be placed in Military Police custody and get us into trouble as well.

KICK IN THE SEAT

We escaped detection many times but one night, when I asked the 16 year old if he would like to go to the show he expressed great fear. As he was usually very eager to go I was puzzled by his sudden unwillingness. It eventuated that, one night when I was on duty, he had decided to go to the theatre by himself. Perchance, a military policeman saw him, caught him and gave him a verbal thrashing as well as a swift kick in the seat and told him that the next time he was caught it would be goal.

Another time, Gracie Fields (The Biggest Aspidestra in the World) and her husband came to visit. She had come to sing at the Boomerang and there were thousands there to greet her. In fact, there were so many there that many had to position themselves on the roof of the toilet block. During Gracie's performance they got so excited that they fell through the roof!

The Army Amenities Station had rigged up a special land-line to relay Gracie's performance to the rest of the island. Unknown to all, including Gracie, an officer at a heavy duty wireless unit nearby had decided to let Gracie have not only an island audience, but a world-wide audience. He arranged the unauthorised broadcast using a high-powered transmitter. This broadcast was heard in Australia and a well-known radio magazine of the period wrote a story about this being the first of similar broadcasts that the troops in the islands were going to make. I believe there was an official inquiry into the matter later.

NAMES

Looking at Morotai Island on my Atlas of the World, I see that there is only one town marked — Wavabula. When we were stationed there we never heard of this town, but it may have been in our area! There were many Australian units there, even the Ninth Division after it had returned from Europe. Whilst there was only one main road running the length of the island, the location of each unit had been given names such as Canterbury; Moonee Ponds; Bondi or even perhaps, Dandenong. They were names which reminded the troops of their homeland — the home they had come to Morotai to defend.

These suburban place names were all interconnected by Army field telephones, trunk lines and exchanges, so if you wanted to make a call from one unit to another, it was often necessary to plough your way through several switchboards before you got to the wanted party. The most used telephone was the ever-faithful "Don Five", which could be called by magneto or bell, although its calling device was a small Morse key.

INKY BLACKNESS PENETRATED BY BEAMS OF LIGHT

Large numbers of Australian troops were camped on the peninsula, and were there when some Zeros came over dropping bombs. I think the most terrifying part of being on the ground during a bomb-raid is the minutes before the enemy comes overhead. First news of an impending raid was given by the coast watch radar, then up go the red rockets, the wail of the sirens begins and all lights are doused. It is an eerie feeling.

I recall one night when I was on the peninsula. It was around midnight and we were awakened by the screaming sirens. I arose from my bunk and went to the flap of the tent to see what was happening whilst my companions remained where they were lying. They figured that if the enemy bomb had their name on it, it wouldn't matter whether they were lying down or standing up.

Suddenly, the inky blackness of the night was penetrated by the beams of about twenty coastal search-lights which all came on simultaneously as if controlled by a master-switch. Immediately, at the focal point of the criss-cross of the powerful beams, almost directly overhead, I saw one tiny aircraft attempting to zig-zag, as the pilot had apparently been blinded by the bright lights. He dropped several bombs, one of which landed about a quarter of a mile from our camp blowing an enormous hole in the ground. The plane was then chased out to sea by about three RAAF planes. The last I saw of it was in the glare of the

beams which were trying to follow it over the water.

INVASION HAD COMMENCED AND WE WERE SURROUNDED

We were well rehearsed in invasion procedures for it was believed that the enemy would attempt to invade us from the sea. Hundreds of servicemen were watching a film at the Boomerang theatre one night when suddenly the film stopped and the powerful light, which was used during interval, was switched on. No announcement was made but we could hear the sound of distant gunfire. Rumour quickly spread through the crowd that the invasion had commenced and we were surrounded.

In the blind panic that followed, soldiers began to run in all directions. In my own panic, I ran through a bushy area headed for the "invasion assembly point" of my own unit. In my hurry in the darkness I fell over a log of wood and was trampled on by half a dozen other soldiers all heading somewhere in a hurry.

Upon arriving at the assembly point we discovered the scare was a false-alarm as news had been received by radio that the enemy wanted to end the war and as the crews manning the coastal guns had been the first to receive the message the gun fire we had heard was from their guns, fired in sheer joy at the thought of the end of the war.

TORPEDOED BY A SUBMARINE

Whilst on duty in my radio hut at *Table Tops* I received a distress message from a Catalina Flying boat which had landed somewhere in the China Sea. The call was made using CW, giving a fix in latitude and longitude, and identifying call letters. I wrote the message down, then not knowing exactly what to do about it, went to the tent of my editor. It was about midnight so of course I had to extract him out of bed. His experience was strictly journalistic and he was not into the mysteries of electronics. He inquired if I had replied to the message but I reminded him that we had no transmitting equipment. This was the reason I had referred the matter to him in the first place as he was my senior officer, and as such should know what to do about it.

The last I knew of the matter was that he had telephoned the message to the RAAF Maybe I had doubled up with the HAAF's own monitors but nevertheless I did what I thought was best in the circumstances.

This was the second distress message I had intercepted — the other being from an American passenger vessel which had been torpedoed by a submarine in the Pacific.

I am now nearing the end of my stories from Morotai Island, I hope they have been of interest.

73 from Joe VK2BJX.

AR

Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Well, Winter has arrived, and although I am writing this in mid-March, I have been able to determine that there has been an ever-so-slight improvement in propagation. True, there have been more pronounced drop-outs on HF, yet I think we may have possibly turned the corner as far as the current cycle is concerned. Propagation on the higher frequencies, such as the 13 and 16 metre broadcasting allocations, has dropped off as expected. The 19 metre band also closes much earlier in the local evening-hours, although there are quite a number of interesting signals in the local daytime-hours.

EUROPEANS EARLIER

The change of season also means that we will hear many European signals coming through much earlier, from 0200 UTC, particularly on the lower frequencies. such as the 31 and 49 metre bands. Interestingly, some of these signals on 49 metres are coming across Antarctica or pretty close to it around that time. This has been noticed by many experienced DXers and SWLers for some time. This is especially noticeable on signals from the UK and Central Europe. As well, the AFRTS station at McMurdo Sound, Antarctica, can be detected, usually with an Auroral flutter on the carrier.

Later on, say about 0300 UTC, the propagation alters, coming across Central and South America. There are some relay stations of the BBC and Deutsche Welle in the Caribbean, as well as Radio Netherlands/TWR in Bonaire, who put in very good signals.

TARGET TO CHILE

In the winter months, broadcasts that are targeted to the Americas from Europe are audible here, particularly around mid-day EAST. One station in particular can be easily noted. The station broadcasts in Spanish and is on a number of channels simultaneously. Not surprisingly, it is Radio Moscow. There are two separate programs — one is specifically targeted to CHile. It sometimes is using another call, so do not get confused and identify it as being in Latin America. Besides being on a number of channels simultaneously, the senders periodically switch programs to RM's Latin American Service.

THE END FOR LYNDHURST

A piece of radio history in Australia recently came to an end. Radio Australia ceased using the Lyndhurst site, which has carried programming for Radio Australia to the South Pacific for over 30 years. The Shepparton site has commenced using all the frequencies previously occupied by Lyndhurst for RA. The primary reason that this change has been made is that the senders were getting old and obsolete, and were unable to compete with their puny 10 kW. Naturally, most SW senders are in the region of hundreds of kilowatts, so the signals were not as effective. The Lyndhurst site is continuing to be operational with the ABC Inland Service from VLR and VLH, with relays of Domestic programming. The Standard Time and Frequency Station, VNG, will also continue, yet the Lyndhurst site will be closing shortly. No decision has yet been made where VNG is likely to be re- located, but it could also be sited at Shepparton. The Domestic HF Service will probably be re-evaluated.

NEW SERVICES HEARD

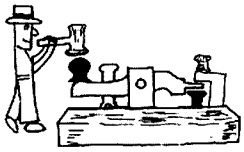
And while we are on Australian HF Services — the ABC Northern Territory HF Service from Alice Springs, VL8A, comes into Launceston very well, particularly in the evening-hours, on 2.310 MHz. The other senders, VK8K and VL8T at Katherine and Tennant Creek respectively, will become operational in the near future. They will all carry the same program from the ABC Northern Territory Service in Darwin. As well, the service carries programming in various aboriginal dialects prepared by the Central Aboriginal Media Association and is separate from the ABC, from time-to-time. QSLs are available on ABC programming and not on CAMA produced programming.

Incidentally, the operational times for VL8A are 1900 to 2230 on 2.310 MHz; 2230 until 0730 on 4.835 MHz and 0730 until 1430 on 2.310 MHz. A report that the service will be a 24-hour service on Fridays is incorrect, judging by monitoring here. When information becomes available on the frequencies and time for Katherine, they will be passed on in this column.

The Radio Australia program *Talkback* is now aired at 0310 and 1610 on Saturdays, and 0530, 0910, 1230 and 2040 on Sundays.

Do not forget that a new broadcasting period commences on Sunday, 4th May at 0100 UTC. Until next time, the best of listening and 73 — Robin VK7RH.

AR



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

This month, I have a strange coincidence, or two, to report. I received a letter from Tony VK1SG, who told me of some comments he had made in response to the Amateur Radio Questionnaire in December 1984, regarding publication in *Pounding Brass* of a list of time and frequencies for VIX and the other maritime broadcast stations for the benefit of those who are looking for good CW to listen to. He had received no acknowledgment, and hadn't seen any publication of the information, so he wrote directly to me. He was also prompted to write after reading the February column on keys and keyers. He has a double-bug, which carries the following inscription; *Automorse. Hitchcock Brothers, Makers. K P Thomas, Adelaide.* The key has been engraved with the name R S Hemsley.

The first coincidence lies in the fact that the April edition of this column contained a description of the very device — *Tom VK5TL says a fellow by the name of Norman Thomas developed (a double-bug) here in Adelaide in the 1920s. The parts were made by Hitchcox Brothers, and Mr Thomas personally set-up and adjusted each one before shipment.* Coincidence because this is being written in February! !

The second coincidence is this — the evening of the day on which I received Tony's letter, I had a 'phone call from Jenny VK5ANW, our Divisional Secretary, who told me she had just received a list of *things to do* from Bill Rice, the Editor, including a request for that very information originating from a VK1!

I can take a hint. I rang the Coast Radio Service installation at McLaren Vale, which is about 15 miles (24 km) south of here. I have driven by many times because it sits on a hill between a favourite winery and the beach. The staff and manager (Fred Reeve), are very helpful and even offer tours of the facility — something I hope to report on in the near future.

The Coast Radio Service, a division of the Overseas Telecommunications Commission (OTC), provides a variety of maritime communication services, including message handling and weather broadcasts in copper-plate Morse, as well as *more modern* modes. Anyone wishing to improve their copying ability is encouraged to monitor the CRS frequencies.

The Editor has been asked to print extracts from the schedules. Copies of the complete guide (including phone frequencies) can be obtained, free of charge, from the OTC or any Coast Radio Station.

For those of you who are struggling to get up to five or 10 words-per-minute, I repeat the advice I have given several times. Listen to traffic well above your capability — even if you only copy an occasional character at first, you will soon find that the odd character becomes the odd word, and before you know it, you will be getting most of the text.

Tony backs me up — *"In the event of anyone arguing that these speeds are useless to learners, then I heartily refute that suggestion".* When he was studying for his amateur licence over 25-years ago, he had to listen to VIX in Canberra and struggle on. There were no tapes for learners in those days.

The following extract from Tony's letter should be of interest:

"If only those empty and rather spiteful critics of CW could face up to the fact that CW can even still get, and be read, where phone never can, and that it is still used for this reason all round the world where getting the message *matters. Yes, technology will phase out CW in the end, though, of course, phone will be discarded first. I sometimes think of a world war ending, in disaster everywhere; all the super technology wiped out; no chips, boards, printed circuit boards available. Somewhere there would arise someone, probably an amateur, who could build a simple oscillator and transmit a carrier. What a pity if he didn't know Morse. If he did, and sent it, what if the man who had contrived a receiver, and heard the signal, himself didn't know Morse! We would have to wait, wouldn't we, until both sides managed to make a modulator and a microphone. Would it be AM or SSB? Perhaps they wouldn't be satisfied unless it was stereo!*

"I happen to know that, in the last war, the English brought in amateurs for training in radar operation, ground and airborne. Hitler had turned all the German amateurs off the air long before the war so their potential was lost.

"I believe that CW should remain mandatory in the amateur licence requirements even if only because of the possibility that one day the amateur community might be called upon to establish communications from what could be resurrected from the rubble of our civilisation."

73 till next month, when we will look at poetry and contests . . .

AR

A listing of Radio Telegraphy Stations of the Coast Radio Service will be published next month.

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Many thanks to the following for supporting the Intruder Watch In January, 1986.
VK2s: BHO, BOS, DEJ, DID, KPI, PS, A Bradford; VK3s: XB, XU; VK4s: AKX, BG, BHJ, DA, KAL, KHZ, MR; VK7RH and VK8HA.

Statistics, which are not really true for the month, as I was away from home for two weeks, are as follows:

Broadcast intruders:	*38*
CW intruders:	*35*
RTTY intruders:	*14*
Other modes:	*17*
Identifications:	*10*

The January reports that didn't make the January Summary will appear in the February Summary, which will balance out the two months totals.

HAVE YOU A 20 METRE BEAM?

I would very much like to hear from any person with a 20 metre beam, as I am looking for bearings on a teletype- like signal appearing on 14.032 MHz daily. I have bearings from the USA, but require some from within VK.

POETIC JUSTICE?

The USSR has been jamming a broadcast station on 7.050 MHz, and there is poetic justice there, for the intruder station UHF3, on 7.048 MHz has apparently had to QSY to 7.040 to defeat the jamming! *Serve 'em right?*

DON'T COUNT ON IT!

A G Sennitt, the associate editor of the World Radio TV Handbook, has replied to a letter from Pat Hawker re Albanian broadcasting.

It seems that most people, including Pat, thought that Albania was **NOT** a member of the ITU, which could have accounted for the irresponsible broadcasting from Radio Tirana on the amateur segments of the 40m band.

However, Mr Sennitt points out that Albania is indeed a member of the ITU, which, coupled with the fact that Albania has, for the first time, registered some frequencies within the *OFFICIAL* bands, would perhaps give the naive among us reason to think that Albania was about to listen to reason, and get out of the amateur allocations . . . *don't bet on it! !* (Radio Tirana, from Albania, can be heard *DAILY* on 7.065, 7.080 and 7.090 MHz).

WILL ANY BE RETURNED?

There is a WARC 87 currently being planned, to decide the fairer sharing of the present shortwave broadcasting spectrum. I hope the amateurs get their fair share *RETURNED!*

GOOD NEWS FOR IW

With the re-organisation of the International Amateur Radio Union (IARU) Monitoring System, *(See AR December, 1985)* an International Co-ordinator has been appointed in the person of Bob Knowles ZL1BAD, the former IARU Region III Monitoring System Co-ordinator. Bob did a remarkable job as Regional Co-ordinator, and will certainly make things move as International Co-ordinator.

As mentioned previously, this is good news for the IW, as Bob will have access, through the IARU Executive Committee, to the International Frequency Registration Board (IFRB). As a result of the vacancy left by Bob's move to the position of International Co-ordinator, I have been appointed Co-ordinator for IARU Region III. I look forward to now being in an even stronger position with regard to access to information, etc, and hope to be instrumental in helping to supply more ammunition for the **Intruder Watch Guns** to sink the **Intruder Ships** who sail into our frequency allocations.

See you all next month, and good DX!

ACKNOWLEDGMENTS

Practical Wireless; VK4AKX.

AR

QSP

A MEMBER NO LONGER

Recently a subscription notice was returned to the Federal Office with a note stating why the members did not wish to belong to the WIA any more. The reason went something like this:

"I have been off air since an accident in April 1985. This accident occurred around 9am, while I was trimming my 160 metre antenna. The centre bolt shed its locking nut which fell five metres and landed on my skull. I then lay on the ground unconscious for some time until a neighbour noticed me on the ground and called my daughter.

The result was that when I regained consciousness about 11pm that night, I was in a straight-jacket in hospital.

I have made no effort to restore the transmitter and appear to have lost interest in amateur radio. As I am now 86-years-of-age this is to be expected.

As I have three ARs, in plastic envelopes, unopened I think I should cancel my WIA membership as I have lost interest in the bug."

This surely shows the determination, true grit and pioneer spirit of the amateur. It is sad that his amateur career should end so sadly.

Club Corner

SPECIAL EVENT STATION

On the occasion of the 75th Anniversary of the Royal Australian Navy, an amateur radio station, operated by the local members of RNARS, will be established at HMAS STIRLING on 11th May 1986. The call sign of the station will be VK6RAN.

For further information, contact Chris Dodd VK6DV, 3 Liege Street, Woodlands, WA. 6018.

AR

DEVIL NEWS from the NORTH WEST

Branch members were thrilled when the Penguin High School, where Branch functions are held, made available a bigger storeroom for storage of equipment such as the base station and RTTY gear.

All repeater modes are well in hand and the next activities night will see the six and two metre aerials underway.

Frank, the Branch News-Co-ordinator advised that the last news broadcast was pre-recorded and sent to the news-reader, ready to go to air. It was well received.

The President of the Branch is calling for ideas and help to establish a base-station at Wynyard High School.

Frank VK7ZFH, was the recipient of the Gong Award for the month. Frank attempted to make contact with VK3 through the repeater but he was talking on simplex and did not get through!

The Horse Trials, held at Westella, just out of Ulverstone, was a great success, with 11 operators taking part. Some had two jumps to look after, others had three. The base was set-up at the start and as the horses left they were put on a stop-watch. As the proceeded through the course, their positions were relayed back to base, also the results of each jump, how many clean jumps, how many refusals, etc.

An ambulance had to be called on two occasions, and help was on hand very quickly.

The operators were thanked for a job well-done and their presence at another one being staged shortly was encouraged.

On 20th February, two NW Branch members ventured to Crotty. Crotty is situated in the south-west of the State, which is approached firstly by a bitumen road, then gravel with the final approach being either by four-wheel drive or foot. The intrepid Winston VK7EM and Arthur VK7SE chose to walk.

Crotty was a mining town which closed down around 1900. At that time it had a good railway service to Pillinger and some of the carriages still remain in the bush — one with a large tree growing through it. Arthur and Winston walked down to Kelly Basin along the old railway track. Contacts were made back to VK7BV, VK7KAB, VK7KC and VK7WZ on 80 metres. The intrepid venturers were using a small home-brewed rig, (built by Winston), a lead-acid battery and a dipole aerial slung over a couple of trees. Reports were 5 x 7-8.

A CW contact was also made, with good copy, on another home-brew transceiver, complete with key and speaker in a Strepsils tin.

The boys must have looked quite a sight, lying on their stomachs in their tent, trying to cope with the rain and understand Morse signals which they had both thought they had forgotten, but the most memorable event of the trip must surely have been when Arthur produced a three layer sponge cake complete with candle to celebrate Winston's birthday.

On the return hike, the boys spoke to VK7PS and listened to the Sunday Morning Broadcast.

Truly a trip to remember.

Contributed by Max Hardstaff VK7KY

AR

Operators at the Horse Trials. From left: Bill VK7WL; Noel VK7EG; Tony VK7AX; Ross VK7WP; Noel VK7WN; John VK7KOR; Owen VK7OL.
Front: Greg VK7ZBT; Max VK7KY; John VK7ZPT and Jack VK7WJ.

AMATEUR RADIO FOR MGGS

An amateur radio station is being established at the Mentone Girls Grammar School by the Science Department as a first step towards the establishment of a Science Club. The Head of the Science Department is a licenced amateur, Paul Butler VK3DBP.

Although in its early stages, the school's radio station is already equipped to make contact with the amateur community around Melbourne — using voice and computer communication (RTTY). Coverage will extend to other parts of Australia, as well as overseas, when a suitable antenna can be located. It is also hoped that amateur television will be added to the station when Paul's experiments with reception and transmission bear fruit.

In the long term, a ground station may be established for communicating through the amateur satellites.

Once operational, the girls plan to transmit regular bulletins on VK3RTV to attempt to communicate with other schools and interested parties.

The school is a member of the WIA and hopes to soon be operating under its own call sign.

Would it be the first all-girls school to have an amateur radio station?

Paul is willing to present a regular school radio network column for AR, what do other schools think?

Information supplied by Paul Butler VK3DBP.

AR

SOUTH EAST RADIO GROUP INC

The South East Radio Group will be holding its popular Annual Convention again in June this year. This is the 22nd convention held by the group and this year has been registered as a Jubilee 150 event.

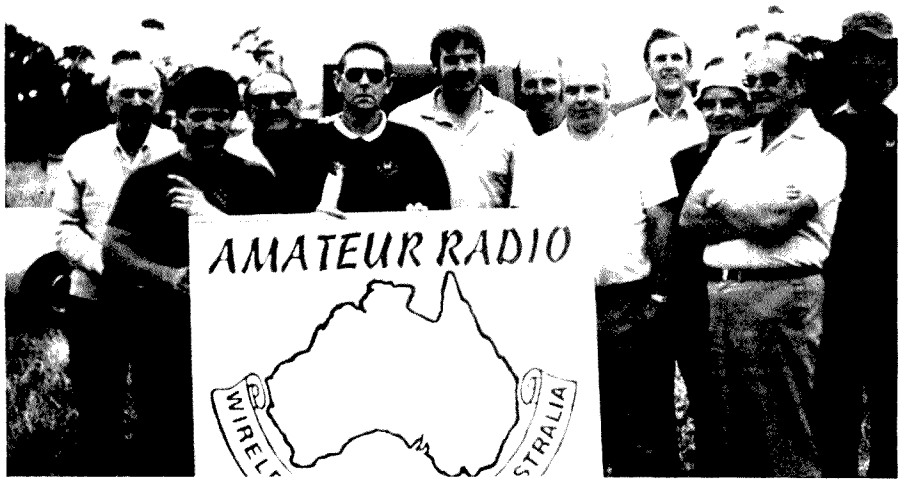
The convention attracts much interest due to the many interesting trade displays, kindly staged by the various companies involved in the retail of amateur related equipment. There are, of course, the ever popular competitions. Such events as fox hunts, hidden transmitter hunts and scrambles to name a few, are available for those interested in competing for excellent prizes and the perpetual trophy. Of course, it should not be forgotten that the renewal of old acquaintances and the meeting of those faces behind the microphone is, to some, the most important part of all.

The convention starts on Saturday, 7th June, with some fox hunts, followed in the evening by the Convention Dinner. The Sunday sees most of the serious competitions and, of course, the now famous Lunch and Tea organised by the hardworking ladies. It really is a must to come along to Mount Gambier on this weekend and join in the fun of this J150 event.

Mount Gambier is situated on the side of an extinct volcano (the Blue Lake), about half-way between Adelaide and Melbourne. There is much to see and do in this lovely city so come and enjoy yourself. Accommodation is normally plentiful, but as the city plays host to many sporting events, etc on this weekend it is a good idea to book early. For a full program, accommodation guide and any other queries, please write to the SERG Inc, PO Box 1103, Mount Gambier, SA. 5290.

Contributed by David Edwards VK5FF.

AR



INTERIM REPORT ON THE SEQTG DUAL 147 MHz REPEATER

To date, the dual repeater facility construction has not been completed, although installation is expected within the next few months.

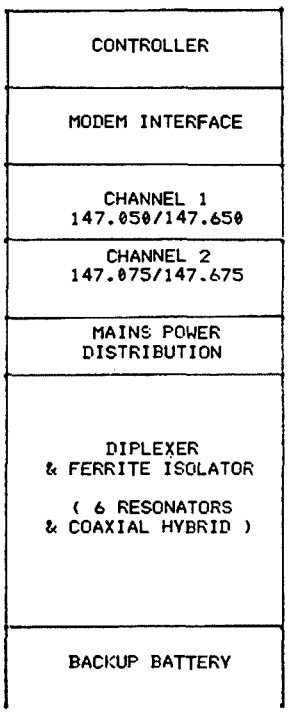
Since initial conception of the dual repeater system controlled by a shared single micro-processor, the project has taken many turns in view of practical construction and technicalities.

One major problem which has meant a complete rewrite of the system software is the change of micro-processor type. The original system was to have used the Signetics 2650 CPU, but the continuing availability of a disk-based 2650 system capable of being used to implement software/firmware updates is in doubt. A search was made over some months for access to a cross-assembler to allow assembly of the 2560 code, and a substantial effort was put into writing such a cross assembler, but was eventually discarded because of errors in assembly which could not be corrected.

Recently, a decision was made to implement a Zilog Z80 CPU as the active processor. This of course has meant that the nearly completed 2650 program had to be discarded and only used for program flow. Although the basic dual repeater control software has been completed, the mess-

age store and test facility has not, and installation will not be proceeding until all software has been implemented to ensure that software — hardware compatibility problems are solved off-site. In addition, redesign of parts of the peripherals has been necessitated due to the change of processor and the incompatibility of its control signals.

The completed repeater facility will be installed in a shortened 482 mm rack in the following manner:



With the exception of the mains distribution panel, all other rack chassis are a standard height black unit, featuring white function lettering.

The channel 1 and channel 2 RF chassis are identical internally and externally, the only difference being the crystals fitted in each transceiver. Each chassis has its own internal mains power supply with battery backup facility, a hardware logic card capable of complete repeater operation including timeout and tail timing and Morse identification. The changeover from internal hardware to external controller is achieved by changing the logic level of a single pin on a rear-mounted connector. The logic is fail-safe in that it requires an externally derived source to effect this changeover. These units are capable of stand-alone operation, only requiring a diplexer and power source.

The transceiver used in each unit is a FM828-25A, modified to allow full duplex or repeater use. Each is capable of sustaining RF output levels of 20 watts or greater. Receiver sensitivity has been measured at about 0.3 microvolt for 12dB SINAD, and muting sensitivity about 0.2 microvolt or better. Internal sub-audible (CTCSS) decoders set to 123.0 Hz will be selectable to allow full CTCSS operation in the future.

The modem interface chassis (not yet completed) will consist of demodulators and modulators for various standards currently in use. These include 170 Hz shift (2125/2295 Hz) to 110 Baud, KANSAS (1200/2400 Hz) to 1200 Baud. An additional modem using another standard is being considered for control purposes only.

The controller chassis will consist of a Z80 processor card supporting a minimum of 32k of RAM (to 48k), 4k of EPROM, a real time clock/calendar, a speech synthesiser and a programmable communications interface capable of operation down to 45.45 Baud under crystal control. An analogue-digital converter (ADC) chip with 16 input channels is also likely to be implemented to allow remote monitoring of the various supply voltages within the system. It also features its own internal mains power supply with memory battery back-up only.

All inter-connections, except power, between chassis use DB25 series connectors, the only chassis with more than one being the modem chassis which acts as a common identification point.

The diplexer (yet to be re-manufactured from the existing facility) will consist of six resonators in band reject mode, three in each leg. Tests on a new configuration show that rejection figures per resonator can be approximately doubled (compared to the same resonators in T shunt mode). Rejection per leg is expected to be greater than 100 dB over the 40 kHz (dual channel) bandwidth, coupled with a lower insertion loss at the pass frequency. The coaxial ring hybrid has been manufactured and provides a minimum of 40 dB transmitter to transmitter (port-port) isolation. Maximum isolation measured was 53 dB, low in the 146 MHz part of the band. A ferrite isolator with a maximum rejection of 64 dB will be installed on one transmitter or the diplexer — transmitter feed point, whichever provides the greatest transmitter intermodulation rejection. An additional series bandpass resonator is to be included in the common receive leg to provide some rejection from other adjacent services, and if required, yet another resonator will be fitted to provide notching of paging frequencies from the adjacent facilities.

A new backup battery has yet to be purchased.

The completed rack when installed in the Philips Communication Services building at Mount Cotton, will be connected to a 6 dBd whip antenna relocated to the top of a large pipe, well above the buildings roof. This should provide unobstructed coverage in all directions. One requirement stipulated by PCS to allow this installation is that the finished product must be of a professional standard.

As could be expected, this is not an easy project capable of completion in a few weeks. The project has taken considerable time in all phases, the initial planning, the licensing, the physical construction and the software development. And the project is not yet complete. The research costs are high but the value of the end product to the amateur fraternity is of major importance.

Also, the material cost are quite high. The two transceivers were purchased in near-new condition with a high price tag. The controller memory is worth about $200 alone. The other hardware, including all the ICs and smaller items, coaxial connectors, etc total up to an amount that would astound the average amateur. Most users do not appreciate the money, time and energy component put into creating a repeater of this type.

At this time, installation at Mount Cotton is expected within the next few months.

Written by Doug Hunter VK4ADC and contributed by Robert Green VK4KUG
AR

MOST EXPENSIVE IN-HOUSE COMMS

Canberra's new Parliament House, due to be opened in 1988, will have one of the world's most expensive in-house information and communication systems.

The house monitoring system will be capable of handling 100 television channels with stereo sound and 100 FM stereo radio stations.

It main task will be to link off-air broadcasts and the proceedings of both chambers to Hansard, the press gallery, the Parliamentary Library, the Member's rooms and public areas.

It is expected that only 55 stereo television channels and ten stereo radio stations will be in use when the building is opened for Australia's Bi-Centenary, but as the building has been designed to last at least 300 years, facilities have been planned for future needs.

The reticulation system for both systems includes 21 km wideband 50-450MHz super low loss coaxial trunk cable, 80 km super shield coaxial drop cable, 600 taps, 1500 splitters and 82 wideband line amps.

Condensed from Electronic News — February 1986

DOC ENFORCES THE NEW RADCOMMS ACT

An unlicensed radio operator, who identified himself as *the original wombat*, was driving a locomotive around a Sydney railway yards late at night transmitting obscenities.

Stopping his illegal activities was all in a night's work for Department of Communications' radio inspectors. They knew someone was operating on the Amateur Radio Frequency Band without authority at the Enfield marshalling yards, so the inspectors took their VHF monitor and went to track him down. But the signal was moving, and when a locomotive went past the signal peaked.

A look at the Department's records showed that the train driver was licenced to operate on the CB band, but not on the VHF amateur radio frequency. The story ended in court. *The wombat* had $300 worth of equipment confiscated, and was fined $200 plus costs.

But it's not a matter of enforcing licensing laws for the sake of revenue. The radio frequency spectrum is a natural resource. But it is finite. There is only so much room on it and it has to fit a lot of users, from marine distress callers to satellite television broadcasts. Unauthorised use of radio equipment interferes with all sorts of legitimate transmissions: amateur use, broadcasts, and much worse, essential services. The Department's job is to protect these transmissions.

In one case recently, a Queensland man made repeated calls to emergency services on marine distress channels, claiming he was with several other people in a boat outside the Southport sandbar. The condition of the bar at the time was dangerous. Although he did not say his boat was in trouble, his continued requests for information about the bar, and his failure to acknowledge repeated warnings alarmed the rescue services. In fact, he was transmitting from his home.

As well as losing the equipment (which was borrowed from a friend who also did not have a licence), he was fined $300 plus costs.

Both of these cases were prosecuted under the old Wireless and Telegraphy Act 1905. Late last year, the new Radiocommunications Act came into force, replacing it. Penalties under the new Act are more severe, as another Queensland man found out. He made straight-forward hoax distress calls to the Cairns coast guard, and was fined $2500 and had $150 marine transceiver and a $200 CB transceiver confiscated.

In recent cases involving unlicensed operations of CB equipment, the minimum fine imposed by courts has been $400. Fines of up to $750 are common. Although the number of offenders prosecuted Australia-wide before the new Act came in had dropped, the conviction rate had risen to 100 percent. With the new Act, the Department not only expects more prosecutions, but is planning to *introduce* on-the-spot fines similar to the ones given out for traffic offences. This will free radio inspectors to check on more unlicensed transmissions, so that everyone can use radio frequencies, for fun or in emergencies, without interference.

The future looks bleak for wombats.

Bill Palmer for DOC Public Relations

VHF COMMS MAGAZINE

The Publishers of VHF Communications, advises that the final edition for 1985 will be printed in the next two to three weeks.

They are gradually making up for lost time caused by the unfortunate death of the previous translator.

The publication of only three editions for 1985 had been considered, but would have caused difficulties with payments. A delayed fourth edition is better than none at all.

The Publishers would like to thank all subscribers for their understanding and sympathy with their problems.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

DISPOSALS ITEMS

Periodically, there are Trash and Treasure days held at Amateur Radio House. The Division has items left over from these various events and some of the components are on sale at the Office. Any member who would like a list of components available should send a stamped self-addressed envelope to PO Box 1066, Parramatta, NSW. 2150, for a copy. Left over from the March T & T was an assortment of printed circuit boards for commercial two-way radios. There are also still some 10.700 MHz crystal filters, as advised in a recent AR.

JUNE FIREWORKS

Plans are underway to hold the annual fireworks evening at Dural, during June. Details will be given on the Sunday Broadcasts. An indication of attendance will be sought on the Broadcasts, so please respond when the item is announced.

SUB-COMMITTEES

This is the time of the year when the Division checks out the various sub-committees. By now, the new Council positions will have been determined. The Broadcast has been detailing these various committees and if you are in a position to assist, please contact the Office.

DIVISIONAL ADDRESSES

To avoid any confusion and delay, all items by mail, **except QSL cards**, should be sent to PO Box 1066, Parramatta, NSW. 2150. The QSL address is PO Box 73, Teralba, NSW. 2284. There is still mail arriving at the old Divisional addresses, even five-years after they have been cancelled.

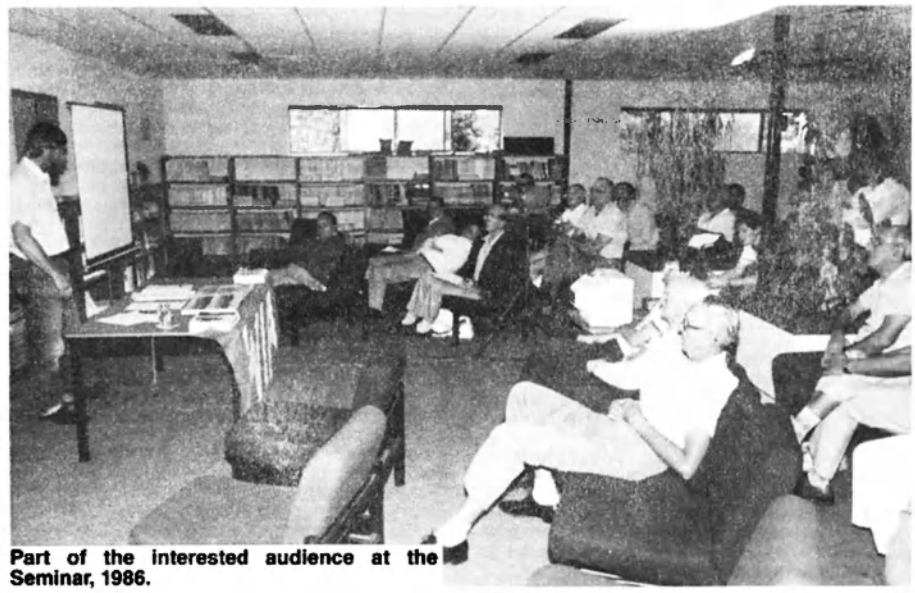
BROADCAST QUESTIONNAIRE

There was a good response to the questionnaire concerning the Divisional Broadcasts, which was distributed earlier this year.

At the time these notes were being assembled, the Questionnaire results were being tabulated. The results will be published in a later AR.

REPEATERS

Investigation for an alternative channel for Liverpool continues. They had a pager move in next-door. :: :: WICEN 7150 had a failure of the transmit-side earlier this year. Equipment upgrade is currently underway. :: :: Armidale District ARC have recently obtained permission to site a 70 cm system on a local hilltop. :: :: Summerland ARC are still trying to obtain permission to a site at Byron Bay for a two metre repeater. :: :: Illawarra ARS have submitted an application to co-site a packet repeater (7575) with their RAW 6850 service. :: :: Assessment forms for repeater applications are available from the Divisional Office.



Part of the interested audience at the Seminar, 1986.

MARCH 1986 SEMINAR

To mark the end of the VK2 Division's celebration of the 75th Anniversary Year, a seminar was held on Saturday, 8th March.

Included in the proceedings was the closing of the *Time Capsule* which is intended to be opened in 2010.

The morning speakers at the Seminar were Colin Christiansen VK2BCC/VK0CC, who spoke about his trip, in the latter part of 1985, to Heard Island, as Radio Operator with the scientific party. Roger Harrison VK2ZTB, spoke about his discussion paper, *Amateur Radio — Future Direction*, which was printed in February 1986 AR.

After lunch, the final material was placed in the *Time Capsule* by the President, Peter VK2PJ, and the lock was closed by Roger VK2ZTB. It will be interesting to see which of his points from the discussion paper will be in operation when the capsule is opened.

The afternoon lectures were given by Gordon McDonald VK2ZAB, who spoke about *Enhanced VHF/UHF Signal Levels due to Aircraft.* AR readers will have seen Gordon's articles in October 1985 and February 1986 issues.

Col VK2BCC, recently returned from the Antarctic, spoke of his exploits as Radio Operator for a Scientific Expedition to Heard Island.

Roger VK2ZTB.

Gordon VK2ZAB, discusses Aircraft Enhancement.

The final lecture for the day was presented by Dr Trevor Bird, from the CSIRO Radiophysics Department. Trevor spoke on antennas for satellite communications.

The three seminars (1984, 85, and 86), were video recorded and copies are now available for loan from the Divisional Office. The format is VHS, either as single copies or two on the one tape. Details are available from the Office during the week, 11am- 2pm, on (02) 689 2417, or by writing to the above address.

The Federal Video Tape Library also has copies, available under the conditions outlined by the Co-ordinator, John VK5KG, in the March edition of Amateur Radio, pages 52 and 53.

Doctor Trevor Bird from the CSIRO, spoke to the Seminar about Satellite Antennas.

1984 SEMINAR

Roger Harrison VK2ZTB — A look at the future direction of amateur radio.
Jim Swetlikoe VK2BVD — Packet radio, the Vancouver system.
Colin Oliver from DOC Canberra — The New Radio Communications Act.
Lyle Patison VK2ALU — Moonbounce.

1985 SEMINAR

Les Grant VK2KYJ and Barry White VK2AAB — Packet radio, 10 months on (from the 1984 lecture by VK2BVD).
Jeff Pages VK2BYY — Doppler direction finding.
David Wardlaw VK3ADW — The WIA and its 75th anniversary year.
John Milton, State Manager for DOC — The Department in VK2.

1986 SEMINAR

Colin Christiansen VK2BCC/VK0CC — A talk on his 1985 trip to Heard Island.
Roger Harrison VK2ZTB — Future direction of amateur radio.
Gordon McDonald VK2ZAB — Aircraft enhanced DX signals on VHF/UHF
Trevor Bird, from CSIRO — Antennas for satellite communications.

The next Seminar is expected later in 1986. If any member would like to present a talk, or alternatively, has a subject or topic he/she would like discussed, please contact the Divisional Office.

AR

VK3 WIA Notes

WIA VICTORIAN DIVISION

412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

The Victorian Council of the WIA would like to welcome the following new members who joined during the month of February.

John Abrim; W Bradford; David Cain VK3XMK; Janusz Drzymulski; Phillip Feller; Harold French VK3ZRM; Mike Hurnell VK3NMK; Ronald Janson SWL; Ben Kefford; Phillip McMahon VK3PJO; George McManus; David McQuie VK3BDQ; Peter Maberly-Smith VK3CFM; Trevor Mitchell VK3CUP; Barry Ridgeway VK3VBR; Friedhelm Rode VK3AFR; Pamela Rohrlach; Phillip Yap and Murray Young SWL.

AR

ELECTION OF 1986 COMMITTEE

At the Annual General Meeting, held on 24th February 1986, the following members were elected to the Committee.
President — Alan Hawes VK1WX
Vice-Presidents — Kevin Olds VK1OK and George Brzostowski VK1GB
Secretary — Ron Millikin VK1KRM
Treasuerer — Ken Ray VK1KEN
Federal Councillor — Fred Robertson-Mudie VK1MM
Committee Members — Phillip Rayner VK1PJ, Ray Roche VK1ZJR and Carl Makin VK1KCM

PACKET RADIO IN VK1

Col VK1AU, dropped a short note on the VK1 Packet Radio scene. It reads thus:

VK1 joins the world Packet Radio revolution with more than a dozen stations equipped with Terminal Node Controllers developed by the Tuscon Amateur Packet Radio (TAPR) Group. Digital communication will be heard on VHF FM, 147.575 MHz (1200 Baud) and 14.103 MHz (300 Baud LSB, 1200 Baud USB). Packet stations all share the same frequency, operating simultaneously using time-sharing techniques.

In late 1985, John VK2XY, spoke at the monthly meeting about Packet Radio. The presentation included a live demonstration, with several stations operating in the meeting room. This has sparked interest in several VK1s, as bursts (literally) of Packet activity can be heard nightly on two metres.

Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT 2606

COMMUNICON '88

An early warning for you all to keep April 1988 free. The VK1 Division is holding a major communications and amateur radio convention in Canberra during that month, as part of the Bi-centennial Celebrations. Hopefully, the 1988 WIA Federal Convention will also be part of the events in Canberra at the same time. This should be the largest amateur radio event held in Australia, and you owe it to yourself to be there.

Already major international companies have indicated a willingness to be involved with the event, and we have booked accommodation and substantial exhibition space. More information will be forthcoming soon, but remember, the place to be in April 1988 will be at Communicon '88.

NEW DIVISIONAL ADDRESS

The new address for all correspondence to the VK1 Division is: ***GPO Box 600, Canberra, ACT. 2601.***

The old Queen Victoria Terrace address will remain for some time until the new address has filtered through internationally.

AR

QUEENSLAND DIVISIONAL COUNCIL FOR 1986

As only 10 members nominated for council, these members were duly declared elected at the February Annual General Meeting of the Division. At the March Council Meeting, the Council sorted themselves out and various duties were allocated as follows:
President — David Jerome VK4YAN
Senior Vice-President — John Aarsse VK4QA
Secretary — Theo Marks VK4MU
Treasurer — Paul Newman VK4APN
Assistant Secretary — Val Rickaby VK4VR
Service Liaison — Val Rickaby VK4VR
WICEN Co-ordinator — Ken Ayres VK4KD
Assistant WICEN Co-ordinator — John Aarsse VK4QA
Research Officer — Dennis Breitkreutz VK4KEW
Club Liaison Officer — Bill Dalgleish VK4UB
Inwards QSL Manager — Hugh Swan VK4BHS
News Editor — Bud Pounsett VK4QY

SOUTH EAST QUEENSLAND TELETYPE GROUP

The group also held their Annual General Meeting recently. The executive elected to office were:

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

President — Peter O'Connor VK4KIP
Secretary — David Brownsey VK4AFA
Treasurer — Shaun Connolly VK4CO
Vice-President — Barry Riddell VK4ZBJ

In his Annual Report to the Group, the immediate past President, Doug Hunter VK4ADC, commended the valuable work done by the retiring News Co-ordinator, Rob Green VK4KUG. He commented on the enormous amount of time and effort that, each week, went into the VK4TTY News Broadcast. This Broadcast has been acclaimed as the best RTTY news in Australia and in recognition of his efforts, Rob was awarded Life Membership of the Group.

BARCFEST 1986

BARC-fest 1986 will be held again this year on the 10th of this month. Dave Prince VK4KDP, urges those amateurs who will be attending the fest to make it a family affair. The venue is the *Indooroopilly State High School*, Ward Street, Indooroopiily, from 9am to 4.30pm. There will be lectures, displays (amateur and non-amateur), home-brew contests and disposals. Parking is no problem and admission is $2 for a family.

AR

QSP

A NEED TO TAKE CARE

Amateurs are reminder that, when selling transmitting equipment, always ensure you sell to a licensed radio amateur operator. The following notice was received on a Bulletin Board by a concerned member and shows the quandary this practice can cause. The article is printed as received.

help needed please!
all users,

i have just purchased some ametuer radio equipment and i don't have a clue about how to use it.
it is as portable system ysasu running on 2m
i don't understand 'repeater stations' or 'simplex' etc
do i need a licence?
how do i connect it to my computer?
can I receive statellite transmissions?
data transmissions?
what are call signs?
can somebody please help me?

Always remember, sell amateur transmitting equipment to licensed amateurs only! !

TECHNICAL SYMBOLS

From time to time Amateur Radio magazine and other radio magazines use symbols in technical articles. Eg The capital letter of Omega is used for ohms, lower case Lambda is used for wavelength. It is hoped the following article may explain to newcomers what the various symbols mean.

The Greek Alphabet is given for reference, as many Greek letters appear in Technical Texts

Letter			
Small	**Capital**	**Name**	**English Equivalent**
α	A	Alpha	a
β	B	Beta	b
γ	Γ	Gamma	g
δ	Δ	Delta	d
ϵ	E	Epsilon	e (as in "met")
ζ	Z	Zeta	z
η	H	Eta	ee (as in "meet")
θ	Θ	Theta	th
ι	I	Iota	i
κ	K	Kappa	k
λ	Λ	Lambda	l
μ	M	Mu	m
ν	N	Nu	n
ξ	Ξ	Ksi	x
o	O	Omicron	o (as in "olive")
π	Π	Pi	p
ρ	P	Rho	r
ς	Σ	Sigma	s
τ	T	Tau	t
υ	Υ	Upsilon	u
ϕ	Φ	Phi	ph
χ	X	Chi	ch (as in "school")
ψ	Ψ	Psi	ps
ω	Ω	Omega	o (as in "broke")

Symbols for Quantities for Use in Electrical Equations, etc.

Quantity	Sign
Length	*l*
Mass	*m*
Time	*t*
Angles	θ, ϕ
Work or Energy	W
Power	P
Efficiency	η
Period	T
Frequency	*f*
2π x frequency	ω
Wavelength	λ
Phase displacement	ϕ
Temperature, Celsius	*t* or θ
Temperature, absolute	T or Θ
Quantity or charge of electricity	Q
Current	I
Voltage (EMF or PD)	E or V
Resistance	R
Specific Resistance or Resistivity	ρ
Conductance	G
Specific Conductance or Conductivity	γ
Specific Inductive Capacity or Dielectric Constant	K
Electrostatic Field Strength	X
Electrostatic Displacement or Flux Density	D
Electrostatic Flux	ψ
Capacity	C
Magnetic Pole Strength	*m*
Permeability	μ
Magnetic Field Strength	H
Magnetic Induction or Flux Density	B
Magnetic Reluctance	S
Magneto Motive Force	G
Self Inductance	L
Mutual Inductance	M
Reactance	X
Impedance	Z
Susceptance	B
Admittance	Y
Base of Napierian logs	e
Damping Factor	α
Logarithmic Decrement	δ
Mutual conductance	*gm*
Amplification factor	μ *or m or A*
Percentage modulation	N
Coil amplification factor or Q factor or other active devices (ωL/R).	Q
Velocity of EM Waves	c

Prefixes for Multiples and Submultiples of Quantities

Multiple or Submultiple	Name	Prefix
10^{6}	Mega-	M
10^{3}	Kilo-	*k*
10^{2}	Hekto-	H
10^{-2}	Centi-	c
10^{-3}	Milli-	*m*
10^{-6}	Micro-	μ
10^{-9}	Nano-	*n*
10^{-12}	Pica-	*p*
10^{-15}	Atto-	a

Signs for Units Employed after Numerical Values

Unit	Abbreviation
Ampere	A
Volt	V
Ohm	Ω
Coulomb	C
Joule	J
Watt	W
Farad	F
Henry	H
Watt-hour	Wh
Volt-Ampere	VA
Ampere-hour	Ah
Kilowatt	kW
Kilo-volt-ampere	kVA
Kilowatt-hour	kWh
Decibel	dB

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Last month, it was decided by Council that due to the lack of space in our VK5 Insert, the President's Notes should be incorporated into *Five-Eighth Wave*. "Good", I thought. "That will be less for me to write". Some hope, guess who is Acting President this month whilst the President has been working in Alice Springs? Still, a couple of metropolitan clubs did come to my rescue with reports on their AGMs.

ADELAIDE HILLS ARS INC

The Adelaide Hills Amateur Radio Society Inc have sent word of their new Officer Bearers.

President is Marshall Emm VK5FN (of Pounding Brass fame), Vice-President is Hans Smit VK5YX, Secretary Gordon Welsh VK5KGS, and Treasurer is Douglas Head VK5NDH.

They would also like it noted that their address for the club is now PO Box 401, Blackwood, SA. 5051, and new members are always very welcome at their meetings on the third Thursday of each month — 7.30pm, Uniting Church Hall, Blackwood Roundabout.

The Society also run Novice Courses, details of which are available from Hans VK5YX.

I would also like to thank the Club for taking on the organisation of a Display Station at Mitcham Rotary Club's Leisure Activities Day, on Sunday, 4th May, in the John Creswell Hall. Pop along and say Hello!

SOUTH COAST ARC

The South Coast Amateur Radio Club has also had a re-shuffle of its hierarchy at its Annual General Meeting. The Committee for 1986-87 is as follows:

President, Russell Smith VK5KAK; Secretary (no nominations at date of writing — all offers welcomed); Treasurer, Viv Lohmeyer VK5AVL; Components Manager, Neville Pudney VK5ZHP; Publicity and QSL Manager, Rob Durbridge; Newsletter Editor, Barry Blaby VK5TO.

Their main activity has been the building and setting-up of the RTTY repeater, a first in South Australia. Those singled out for special mention include Nick VK5NT and his wife Diana, Graham VK5AGA, Bernie VK5ABS, Neville VK5ZHP, Mike VK5AMT, Peter VK5ZM, Alan VK5KAL, Bob VK5KNE, Lee VK5NK, Clem VK5GL and Craig VK5ZAW.

Not all of these were club members but all helped in some way.

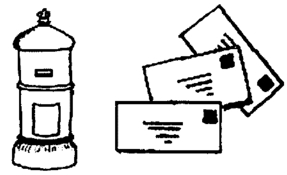
Also, I am sure that the Club would like me to thank John Gill VK5AJG, who has been their President and Newsletter Editor for several years now. John has always been very conscientious in both positions and a good liaison between the Club and the WIA. I am sure you will be missed, John.

They are also pleased to welcome visitors and new members to their meetings on the first and third Thursdays of each month. Time is 7.30pm at the Karawatha Community Centre, 12 Baden Terrace, O'Sullivan Beach.

DIARY DATES

Tuesday, 27th May — General Meeting of the WIA VK5 Division. Speaker will be Barry Bryant VK5KAU, speaking on the Central North Amateur Television Repeater — its history and technical details, with video and/or slides to illustrate it.

AR



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

ON THE STAGE? — NAY, A RADIO AMATEUR

In the March edition of Amateur Radio, page 55, under the heading of *Inaugural Meeting*, a photograph of the South West Zone of the WIA, NSW Division was displayed.

Pictured there was the former President, Jim Corbin VK2YC, and I was sad to note that he was a Silent Key. The contribution was made by Jim Edge VK2AJO.

When I was a boy, living in the Sydney suburb of Eastlakes, Jim was our family's chemist in the late 40s and early 50s. I knew his younger son, Vince, well and I was told that his dad was a *Ham*.

I must admit I was confused. I could not imagine a rather sober and methodical man as Mr Corbin being an actor and I said as much to his son. He then said, *"No you fool"* or words to that effect and went on to explain that his dad was an amateur radio operator and talked to people *"all around the world."*

As a young teenager then and believing that talking was the God Given Right of all people of my age group, I was very impressed. One had an opportunity of talking to the world and it appeared that very few had the facility of talking back — an advantage that I liked at once.

I spoke to Jim (from the other side of the counter — that is Mr Corbin), and he indicated that much of his transmission was CW. I then pondered the vagaries of Morse and the allocated bands propagation, potential. At that time, I put this on the *Too Hard File*, but the seed was sown.

Many years later, I pottered around and finally I too became a *Ham* and I think I have Jim Corbin to thank for it. He likened the attainment of this qualification to a combination of the properties of Captain Marvel and a standing invitation to Camelot (and quite rightly too).

I would be grateful to Jim Edge or any other members who can tell me what happened to Jim and his family after Eastlakes. Did any of his siblings follow in his footsteps?

Yours faithfully,

Peter Jackson VK4ZP,
347 Monaco Street,
Broadbeach Waters, Vic. 4217.

AR

ENLIGHTEN OR ENLIVEN

Referring to Tony Tregale's letter and the editorial reply in the March issue of AR. Tony has raised an important issue and his argument deserves more consideration. The Amateur Radio Movement is threatened by a developing authoritarianism in organisations formed from minority groups belonging to the Amateur Radio Movement. I offer the following to enlighten or enliven the discussion.

The Amateur Radio Movement is not intangible: it comprises persons whose object is the art of amateur radio communications. Some members of the ARM choose to participate in the International Amateur Radio Service as defined in Article 1 of the ITU Radio Regulation. These amateurs are united by the ITU definition, their licence qualifications and the international agreements and national laws which regulate their use of the amateur radio spectrum allocations. These laws and agreed regulations prevent anarchy by amateurs in the radio spectrum; this is the only effective protection.

Some of the licenced amateurs (a minority world-wide and about 50 percent in Australia) choose to belong to national organisations such as the WIA. These organisations provide a service for their members and foster an awareness of the Amateur Radio Service among national communities. They do not and can not control the ARM.

A majority of the ARM choose not to belong to a *representative* organisation. There is no compulsion to belong (except in a minority number of countries) and it is not necessary to belong to participate. Amateur radio is one of the few spare-time occupations which does not require facilities provided by a supporting club, league, institute, etc. (The pitch is self maintaining natural resources; bring your own equipment and there will always be players, 24-hours, every day). This fact is the reason amateur radio attracts many independent participants and the existence of these is an insurance against an ascendancy of authoritarian organisations with a preference for the power of numbers rather than competent service. The ARM is not leaderless, the directions are clearly indicated by people with talent who realise that leaders are for the benefit of the followers and not vice-versa. These same leaders have founded an administration which makes it easy for genuine amateurs to do what they want to do. The great danger is the possibility of being misled by the proponents of unplanned changes.

Representative organisations, in their occasional recruiting campaigns, use the argument that representations made by them to the administration are more effective. This is fallacious, an individual acting outside the *party line* has many more avenues available than the organisation and these can be more direct and more effective if a particular issue has to first run the gauntlet of organisation officialdom. If an administration accepted group representation only, it has to determine firstly whether or not the proposal is supported by a majority of its membership and whether or not the organisation membership is a majority of the interested persons. How does the WIA determine the popularity of its proposals? Secret ballot? Any other form of democratic canvassing? Decision by the Executive acting without consulting members?

The campaign of shaming independents into membership is not 75-year-old wisdom. The ARM needs a good population of independents, they are not *free-loading* and it is insulting to suggest that they are. They are not cajoling us to forego our group activities.

The future of amateur radio does not depend on the activities of supporting organisations. Doing something for the love of it is a human characteristic and people will be radio amateurs for the love of it, with or without the support of a *representative* organisation.

Yours faithfully,

Lindsay Lawless VK3ANJ,
Box 112,
Lakes Entrance, Vic. 3909.

AR

FOOD RECIPE COOK BOOK

I am replying to Glyn Gibbings-John VK2DJV, whose letter appeared in this column of the March edition, and whose comments may have puzzled many readers.

In order to clarify the matter, it is obvious that Glyn ordered and obtained the Cook Book produced by the Wagga Amateur Radio Club, through Dave VK2ZVE, with the misunderstanding that it was of a technical nature, but in fact turned out to be a food cook book.

What he should have done was to write to Dave and explained his disenchantment and his money would have been refunded.

This letter is written, not to vindicate the allegations, but to inform other readers of the fscts.

Around last July, I wrote the VK2AXZ Cook Book, of which Westlakes ARC had 1000 copies printed, for sale at the price of a schooner of beer or a packet of cigarettes which was considered good value. One VK6, on holidays here took 10 copies home with him!

At the time of writing there are only 97 copies remaining.

It was coincidental that, around October, the Wagga Radio Club produced their excellent food recipe Cook Book, edited by Dave VK2ZVE. I obtained a copy and wrote back congratulating the Club on the marvellous team effort, as no less than 70 amateurs, family and friends contributed their combined recipes.

Large radio clubs have high overhead costs, financed by memberships subscriptions. In order to keep these annual subscriptions at an affordable level other finances are augmented by various functions — selling raffle tickets and cook books.

It is regrettable in Glyn's case, that the misnomer and incorrect idiom caused a lack of correct communication, and it might well be that concept of the word wombat in the Metropolitan areas differs to the marsupial found in rural Bingarra!

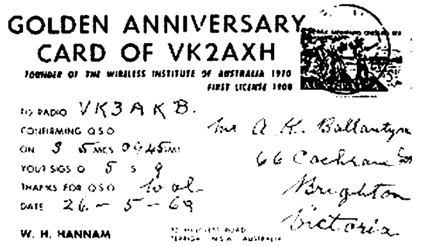
Les Daniels VK2AXZ,
9 Highfield Terrace,
Cardiff Heights, NSW. 2285.

AR

POLAR RADIO

After reading the interesting article by Tony Smith G4FAI, about Mawson's Polar Expedition, I delved into my old QSL cards to find one from Wally Hannam VK2AXH, who was Mawson's main base wireless operator and mechanic.

In his book, Mawson mentions Hannam repeatedly and on page 87 he says, *"Hannam had various occupations, but one was to attend to the needs of the inner man, until the completion of the hut. There is no doubt that he was regarded at this time as the most important and popular member of the party"*.



S N Jeffreys relieved Wally during 1913, but many Old Timers in Sydney will remember VK2AXH.

I don't think that any signals were ever received in Melbourne but the story goes that a wag in Melbourne pretended that his signals came from Mawson with a message to the Governor that, *"Douglas Mawson had climbed the South Pole and got a splinter in his toe"*.

73,

Keith Ballantyne VK3AKB,
"Staverton"
Quamby Road,
Beaconsfield Upper, Vic. 3808.

AR

POLAR RADIO

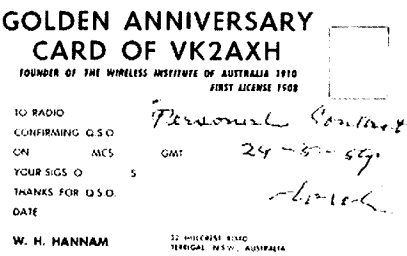
I was most interested in the article on page 17 of Amateur Radio for the month of March, 1986, titled: *Polar Radio — 1912 style.*

On page 19 is shown a picture captioned: *The station on Adelie Land.*

What you apparently did not know and neither did the author, G4FAI, was that this was a picture of Wal Hannam, then 26- years of age, for many years and up until the date of his death, the holder of the call sign VK2AXH. Wal Hannam lived in retirement at Hillcrest Road, Terrigal, New South Wales, where I met him in 1959, when he was about 74-years of age. Wal presented me with one of his OSL cards, which stated on one side that it

was the *"Golden Anniversary card of VK2AXH, founder of the Wireless Institute of Australia 1910, first license 1908"*.

On the other side of the card is the same picture as in Amateur Radio, endorsed with the words *"the picture shows VK2AXH (Wal) in the Antarctic 1912"*. He endorsed the card for me for *"personal contact 29-5-59"*. (No doubt a number of older amateurs probably have a copy of this card also). The picture, by the way, was taken by the famous Australian photographer, Frank Hurley, who was also a member of the expedition.


GOLDEN ANNIVERSARY CARD OF VK2AXH

FOUNDER OF THE WIRELESS INSTITUTE OF AUSTRALIA 1910 FIRST LICENSE 1908

TO RADIO Personal Contact

CONFIRMING Q.S.O.

ON MCS GMT 24-5-59

YOUR SIGS. O 5

THANKS FOR Q.S.O.

DATE

W. H. HANNAM

Wal was a member of the original Sir Douglas Mawson Expedition which left Hobart in the AURORA on 2nd December 1911, for the Antarctic. A base was established on Macquarie Island, after which the ship pushed through the ice and landed a party on an undiscovered portion of the Antarctic continent.

Wal Hannam was responsible for the choosing of the wireless station site at Macquarie Island, known as *Wireless Hill*, which rose to 350 feet in height and formed part of a peninsula running in a north-easterly direction from the main island. It had been chosen by Wal because of its open northerly aspect, and because the site would probably have a good throw-off south to the main base in Antarctica. This fact was clearly acknowledged by Sir Douglas Mawson in his account of the expedition which he published in 1915. Wal also built the hut for the radio equipment and a separate one for the petrol motor and generator, and set-up the radio station at the main base at Adelie Land, (see map AR, p18), and here operated the station for two summers and one winter, before returning to Australia. He was also assistant magnetition for a time.

The operator referred to in the article, S N Jeffryes, was the wireless operator who relieved Wal Hannam in Adelie Land. He joined the further sailing of the AURORA which left Hobart on 26th January 1912, to return to the Antarctic. Wal left Adelie Land on 6th February 1913, and returned to Australia. Both Jeffryes and another operator, A J Sawyer, were employed by the Australasian Wireless Company, who supplied the two complete sets of the Telefunken wireless apparatus used by the expedition.

I feel very grateful in being able to bring the above information to the attention of readers, showing that the pioneering spirit of amateur radio in Australia was alive and well as evidenced by the work of Wal Hannam, and such spirit helped to further scientific and geographical research in the Antarctic at the beginning of this century.

B L Mills VK2AJE,
PO Box 10,
Cronulla, NSW. 2230.

Further information about Wal Hannam was printed in Amateur Radio, May 1984, on page 51, when his eldest nephew, John Bathgate (a non-amateur) wrote of his exploits in amateur radio. Prompted by Mr Bathgate's information, July's magazine, pages 58 and 59 carried a photograph of the above mentioned card and information that the Redcliffe Radio Club had much photographic memorabilia of the 1911 radio shack at Cape Denison, which it was having transposed into acceptable black and white photographs which would be suitable for reproduction in AR. — Ed.

AR

QUALIFIED COMMENT

Having had some association with Federal WIA administration and affairs over several years, I feel qualified enough to comment on the nonsense in Tony Tregale VK3QQ's letter in March AR, and desire to direct my remarks to him via the same mode.

Amateur repeaters, whether WIA funded or not, are by their licensing structure *open access*.

The WIA, under the terms of its Constitution cannot, has not, and will not suggest other wise. It exists solely for the purpose of the furtherance and improvement of the Amateur Radio Service.

Its administrators are volunteer amateur operators, giving their valuable time freely to help others, members and non-members alike.

To suggest that the WIA promotes discrimination, and gains finance and power, shows an ignorant and complete lack of understanding of the real facts.

For many years, the WIA has struggled to achieve the benefits which Australian amateurs currently enjoy, and it has only been able to obtain these benefits through sheer determination, and the financial backing of its members.

WARC 79, Novice Licenses, Amateur Examinations, K-calls, the Government recognition of WICEN, the retention and expansion of Amateur Bands, are just a few examples of the results achieved by WIA volunteers.

Is this the activity of a discriminatory association?

Do you really think the funds raised by its members subscriptions are going to give it power and destroy our original concepts?

Be realistic Tony, recognise the fact that without a continuing recruitment campaign, and injection of funds to its activities, the WIA will not be in a position of unity to combat the commercial interests that want our bands, nor finance projects such as Repeaters, Amateur Satellites, Educational Classes and Facilities, and WICEN Equipment.

The next WARC is only just around the corner. WARC 79 cost the WIA over $20 000 for its representation, paid for by members funds — not Government grants, or donations, *just WIA members.*

Look at what it achieved!

Nobody knows what will happen at the next WARC but you can bet the last WIA dollar that it will be there. We cannot afford not to be!

These are the facts Tony, and if members of the Amateur Radio Movement feel justified in not helping themselves through WIA membership, then they have no one else to blame if more powerful commercial interests succeed in reducing the hard won benefits previously obtained.

73,

Yours sincerely,

Bruce Bathols VK3UV,
6 Ann Court,
Aspendale, Vic. 3195.

For the benefit of newcomers, Bruce is a former Editor of AR and a former Federal President of the WIA. — Ed.

AR

HOW MANY HAVE BUILT A TRANSMITTER?

After reading the editorial in March '86 AR, I looked up the January issue and then March *Over to You!* and can only feel that Tony Tregale is of the opinion that, in today's society at least, there is a tendency for organisations, or perhaps of some individuals with power within organisations to tend to become self-serving in their outlook, or to make assumptions that what the organisation does is good for all, because the organisation did/does it. He sometimes has a point there, human nature being fallible. It's good to see he has that view and has also participated in the administration of the activities of the WIA instead of just being an armchair critic.

I also noted the editorial interest in *How many of our newcomers built their own first transmitter? How many have built their first (or any) transmitter over the last 40 years?*

My interest in radio started when I was 13 or 14 years of age, (or in 1942 or 43). However, I confined my activities to constructing various forms of receivers until about 1978. In October of that year, a meeting was held at Urunga (North Coast, NSW), which I attended, and it was decided to form an amateur radio club in the general district of Coffs Harbour.

Since my teenage years, I had purchased new, the occasional copy of the ARRL Handbook and I still had a copy of the 1969 edition, purchased for $6.70, which had a circuit and construction data for a Transistor 5 Watter for 80 and 40.

I had some green plastic plug-in coil formers, bought for possible use in a future receiver years before. As they were one inch in diameter they fitted-the-bill nicely. An old ex-PMG telephone box of dove-tailed wood, with a piece of marine ply for the top board, and pieces of tin-plate, cut from food tins tacked to the bottom for soldering components and wire where needed was used for a chassis. I used 12 volts instead of 28.

This unit has proved an intriguing design as it uses a 250 mA pilot lamp to tune the amplifier and a 150 mA pilot lamp to tune the output and has done duty on several club displays since its construction.

The circuit called for two 2N2102 transistors which were unavailable locally, so I substituted RS 2008s, purchased a crystal for 3.530MHz and a Morse key. (I already had a DX 160 receiver). Since then I have had CW contacts in Australia and New Zealand using this transmitter.

I obtained my NAOCP licence, VK2VQI, on 26th June 1979 and my AOCP, VK2DMV, on 10th June 1980.

Other small transmitters I have constructed include the ARRL *Sardine Sender* 80-metre QRP crystal controlled unit, a VFO from the 1979 ARRL coupled to a HB amp and PA on 80 metres also, and a VFO on 28MHz which demonstrated a new frequency can vary with temperature on 10 metres.

My main interest in radio remains with such home-built projects although I obtained an FT101E in 1979 and have had a lot of interest experimenting with different types of antennas to suit my perceived needs of the time.

I would like to record my appreciation of the WIA Code Practice Sessions, NSW and SA in particular, during 1979 and 1980, and at odd times since when I determined to *brush-up*. Also thank you to Marshall Emm for Pounding Brass.

With best wishes,

Paul Ireland VK2DMV,
109 Victoria Street,
Coffs Harbour, NSW. 2450.

AR

THANKS WIA

I first became a novice in August 1985, as VK2NLK. I passed my 10 WPM CW in November and then in February I passed the full-call theory.

I used the WIA novice kit and AOCP correspondence course for study, and listened to the VK5 slow Morse broadcasts also.

I would like to thank the WIA for making these study courses available. Also, many thanks to Cec Bardwell for his constructive criticism. My appreciation also goes out to VK2XJ and VK2PYQ for helping me with CW-practice.

Thank you.

Laurie Keane VK2CXX,
80 Hudson Parade,
Clareville Beach, NSW. 2107.

AR

HELP WANTED!

Has anyone any ideas if and where I may obtain a Log Book program for radio contacts which will operate on my Commodore 64.

Regards,

A M Stephenson VK4WBZ (soon-to-be VK1NUN),
Box 255,
Woden, ACT. 2606.

AR

NE'ER A COMPLAINT, BUT. . .

I do not usually complain about anything, (being 82-years-old and still enjoying a reasonably full life), but I am just a little puzzled about one thing. I refer to the QSL cards I have and have not received from stations I have been in contact with over the past two years.

I always QSL 100 percent and expect others to do likewise, but following is a breakdown of stations:

VK1, six stations worked, one QSL received; VK2-41 contacts, six QSLs; VK3-28 contacts, 10 QSLs;

VK4-24 contacts, eight QSLs; VK5-21 contacts, nine QSLs; VK6-17 contacts, seven QSLs; VK7-seven contacts, two QSLs and VK8-five contacts and one QSL received.

This is a total of 149 QSOs for 44 QSLs, and rates at less than one-third and overseas stations have a similar record. From Japan I have received 100 cards for 300 stations contacted and others — 23 for 62 contacts.

Some stations (real amateurs), reply very quickly, whilst others do not reply at all. This makes it very difficult to obtain awards.

I hope this letter reaches the eyes of the *tardy-ones* and brings some action — here's hoping.

For the *real amateurs* I thank you.

Many may ask why I don't upgrade to a Full Call. With up to $70 for examinations fees — no way.

73,

Geo Payne VK4NEV,
12 Thomas Street,
Maroochydore, Old. 4558.
AR

INSPIRED

I was interested to read the editorial in February's Amateur Radio, concerning technical articles. I have always enjoyed home-brewing and the comments in the editorial inspired me to sit down and describe a VFO that I have been very satisfied with since I built it some years ago.

I enjoy the magazine every month and I think the inclusion of more technical articles can only improve it. Keep up the good work.

Kind regards,

Morris Odell VK3DOC,
84 Hill Road,
North Balwyn, Vic. 3104.

Watch for Morris' article, A Stable VFO with Digital Readout, in a future issue of AR. Are there any other members who may take up the challenge and also become inspired? Ed.

AR

POWER LINE INTERFERENCE

I was pleased to see Sam VK2BVS, taking up the Power Line Interference problem.

Although Sam has touched on the main problem, that of *politics,* he has not mentioned this is the main stumbling block to getting action from the authorities.

You see, DOC in Canberra agree in principle (or in theory) that there is equality, ie complaints from amateurs about interference to their reception are treated equally to complaints from other services . . . However, *this is not the case in practice!*

DOC State Offices, and Field Officers have been instructed for years that it is DOC policy not to investigate incidental radiation (or any other) interference affecting the reception of authorised radio communications by stations in the Amateur Service.

It is time the WIA (so far the only ones allowed to talk to the DOC) got off their posterior and got on with some positive and effective action on this long standing problem.

Tony Tregale VK3QQ,
38 Wattle Drive,
Watsonia. Vic. 3087.
AR

1985 REMEMBRANCE DAY CONTEST

The Orange Amateur Radio Club is unable to understand how, when five logs are posted in the one envelope to the FCM, only three (DEW, DXG and AOA) appear in the results. The others, ASY-20 and DSM-20, are missing! Surely Australia Post is blameless in this case?

The same applies to BFR and BNH — two in one posting — one listed, one missing.

It is suggested that, as a proof of a log being received by the FCM that a SASE be enclosed with your log. Then the FCM puts his rubber stamp on the back of the envelope and posts it back. No extra work for the FCM — he's going to the Post Office anyway — but confirmation that your log got there.

Wally Watkins VK2DEW,
Honorary Secretary,
Orange ARC,
PO Box 1065,
Orange, NSW. 2800.
AR

AR —FUTURE

With respect to the article in February AR, *AR — the Future,* I am one of the group that entered amateur radio as a direct result of the CBRS. I obtained my novice licence several years ago, and my limited a few years later. Due to a loss of interest in telegraphy, I am now mainly interested in the VHF/UHF side of the hobby.

When I was a CBer, I always looked at amateur radio and felt that it was too hard to get into, that is, until I was told of the novice licence. Even then I was discouraged by the CW examination. Looking back, I still feel the same, and have always said that a lower amateur class than the novice would have helped. The proposals in February AR is just what is needed to encourage newcomers to this hobby, particularly now that we are in a low part of the sunspot cycle.

A licence, similar to the one proposed, with an exam similar to the current novice theory, but *without the CW,* would be just right. Then a pass at five words-per-minute would be needed to obtain the current novice licence, as it is now.

If an enhanced version of the current novice is not forthcoming, then a licence between it and the current limited licence, to give the proposed intermediate class, with its digital type privileges. Finally an extra class between the limited and full class to give all the privileges of the current full licence and a new full class with all the defined mode restrictions removed.

This would encourage new CBers, and the computer kids to join AR.

Yours sincerely,

Peter Scales VK6KHZ,
B-34, SMQ,
Paraburdoo, WA. 6754.
AR

HELP OFFERED!

Some time ago I found it necessary to overhaul my 20-years-old Mosley TA33Jr beam antenna. After some difficulty, I was able to obtain full reconditioning instructions from Mosley, which resulted in *as new* performance. I also still have the original assembly instructions.

If any reader would like to obtain this information I would be happy to provide photocopies, at cost, plus postage; ie four sheets @ 25 cents plus 33 cents postage. Four 33 cents stamps will fill the bill.

Best 73,

George Cranby VK3GI,
PO Box 22,
Woodend, Vic. 3442.
AR

DISCUSSION PAPER

I read the *Discussion Paper* and subsequent letters re the future of amateur radio with interest. Combined with the Federal Education Officer's report on the low pass rate for AOCP/LAOCP examinations and the disproportionate age groups for licensed amateurs.

In the days of the Youth Radio Club service, sponsored by the WIA, the young were encouraged to enjoy amateur radio in schools, colleges and clubs (such as YMCA) throughout the nation. The instructors were licenced amateurs freely giving their time to the nations youth in the areas where they lived. The provision of certificates at suitable stages encouraged their interest and prepared them for the final objective, an amateur licence. The number of entrants, and indeed the pass rate, for YRCS students was high and they were already indoctrinated with the amateur code.

The demise of the YRCS and the voluntary instruction was replaced by divisional classes run by professional teachers, many of whom were not amateurs and being paid at the full institute rates, their interest may be considered pecuniary. Following the initial CB rush, the numbers declined due to the now central venues and by no means least, the prohibitive cost. This is not to say that the Federal and Divisional Education Officers were not trying, but the regional areas became non-existent as minimum numbers to run a class were not available. In fact, the avenues of access to amateur radio reduced by 90 percent purely on monetary considerations. I argued fiercely against this decision both as a Federal Councillor and State Supervisor for YRCS at a meeting when the decision was made.

Scores of possible amateurs have thus been lost to us since money, not love of a hobby, has become the key to the amateur ranks.

Let us as amateurs re-establish youth training back in the schools and clubs, look to voluntary teachers and give our time to the nations youth (not take their money), return the skills and enthusiasm which was given to us in our time.

As a Technical Instructor of a large electronics company I offer my time freely in the spirit of amateur radio, but will not sell it, out of respect to those amateurs who gave to me. I believe the WIA has been guilty of neglect to the nations youth thus, ultimately to itself, bringing about the present situation.

I accept that my view may not be popular, or even accepted in some quarters, but it is mine and forwarded as one view of the situation for consideration.

Respectfully 73,

Gerry Preston VK5PI,
13 McGowan Road,
Para Hills, SA. 5096.
AR

From the point-of-view of an historian, may I make a short personal comment on the discussion paper presented by VK3PC and VK2ZTB, February AR.

Under the heading *Demographics of VK Amateurs* the sentence *"the many of todays Old Timers started when they were teenagers"* may be a little misleading. I have recently researched the 300 amateurs licenced pre-WWII in VK4 and found that the number of teenagers under 17-years among them could be counted on one hand. I also recall being the youngest (aged 17) of those 40 odd who attended WIA meetings in the mid-30s — so the number of teenage amateurs may never have been as high as imagined. It is interesting to note the 52 percent of the present national WIA membership is 50-years of age and over. Most of this group, whose average life span approaches 70-years, would operate on HF only: something to be remembered in future planning, if balance is to be preserved.

In spite of my distaste for CB, a beginners 70cm Telephony Permit has merit. However, it must be remembered that, as examinations are made easier, the trend will be towards a CB mentality. There will be no home-brewing or experimentation and the *technical revolution* talked about by VK2ZTB will be bought over the counter and plugged in. In my view, the standard of amateur radio can only be maintained by a mandatory requirement of up-grading.

I have no argument with the authors of this paper when they say, *"that digital developments in communication and information systems are the frontier of technology and experimentation".* If this occurs, the face of amateur radio will be changed radically. The beginner will know no other state of the art and accept it for what it is — but the Old Timer will begin to wonder of the hobby should be given a new name to fit its new image. The long term benefits of enticing those who are concerned with computers first — and radio second — may not turn out to be for the best. We all know that S and T alone have failed to fulfill our basic needs; without strong social bonds the Amateur Radio Service is incomplete and likely to disintegrate.

It might be an idea to ponder a moment on that piece of hardware which is already influencing our technological future — a computer. It is the very simple-mindedness of the computer that enables it to play a significant part in it highly symbolic relationship with humans. We are everything it is not. Human beings, by and large, are motivated, imaginative, intuitive, idiosyncratic, humorous, fanciful, sensitive to values, pragmatic, moral, amoral and capricious, etc. Marvel though it may be, a computer is simply a soulless machine that pays undivided attention to details that would drive a mortal right out of its mind.

My activities as a DXer can be used as an example of the above. In dealing with a *pile-up,* I can indulge in an endless number of capricious decisions taken in quick order, at will. I can select the loudest signal or choose to ignore it, decide to

reply to a particular *fist* because he sounds like a battler, work another simply because she calls continually and has become a pest, or choose to ignore her, select another call because it is vaguely familiar — and so on — as the options are endless. All this, through a QRM cacophony of a hundred callers. What computer exists that can be programmed to function in this manner? None!

Another eerie interface existing between man and the computer is that of affection or hypnotism. It can be demonstrated scientifically that many who work with these machines become beguiled by their qualities, reading a kind of *alter-ego* into their responses. Journalists are a good example, in that the product of their minds transferred to a VDU subtly hypnotises. Man will always be irresistibly drawn by the apparent benefits of new technology for its own sake — a lure that may eventually undo us.

To an historian a study of past events enhances one's ability to predict future trends, but the idiosyncratic and capricious nature of man himself, prevents any scientific determination. Even with the aid of computers and the applied method of *quantification* to some degree, man must remain forever in the dark. Strange as it may seem, this is probably for the best.

It must be recognised that there is a price to pay for everything and the advance into automated technology has already resulted in a depersonalisation of the operator. In the long term this may not work for the good of the hobby in various ways. I can visualise the situation where unattended stations are licensed and the operators use numbers, not names.

The thought of home-brewing being outlawed and the sharing of HF bands with non-technical operators and *machine moders* who do not sign in international code or voice are anathema to most OOTers. It is not their idea of amateur radio. The hobby needs more technically skilled contributors, not a host of CB-type operators.

The future of amateur radio belongs to youth, but it must be remembered they are only part of the whole scene, consequently, balanced judgments are imperative. The opinions of the 50 percent of VKs who are not WIA members also deserve equal consideration.

It would appear to this writer that our real destiny does not lie as much in our own *lay* hands as it does in the coercive powers of commercial interests (the CRRL licensing proposal is one example). As well, it will be influenced by decisions taken by policy makers around the world. Unfortunately, many of these decisions will turn out to be wrong and worse, irreversible — but that's the way history goes.

If left to our own inclinations, the type of future technology most likely to be accepted by the majority will be one that allows the exercise of **maximum personal identity** and **intimate voice QSOs** where the implications behind the spoken word are clearly conveyed.

Alan Shawsmith VK4SS,
WIA Queensland Historian,
35 Whynot Street,
West End, Qld. 4101.
AR

I refer to the excellent article by Messrs Jim Linton and Roger Harrison in the February 1986 issue of Amateur Radio.

As a member of the WIA since 1980, (Membership No 11599), I would like to add my thoughts to the future direction of the Institute.

There is no doubt that an alarming trend in membership is evident in that the loss of youth and therefore new members, will ultimately result in difficulty in finding future office bearers, and also in the loss of income for the Institute.

The introduction of the Novice licence about 10 years ago resulted in an upsurge of membership, and a further renewed interest in amateur radio would result if the proposals by Messrs Linton and Harrison were implemented.

Let me add the following points in support, firstly, of the proposed Telephony Beginner's Licence.

As pointed out, this gives access to our hobby and is an ideal method of introduction. Subsequently, the enhanced Novice licence would be an admirable aim for the beginner, being a further step to a full call.

An interesting development over the past few years has been the transition of CB operators to the current Novice licence, interest having been thus stimulated, the progression from Novice to full call has been very satisfying. The introduction of a Telephony Beginners Licence would produce similar results.

We should now ask which are the best methods of approaching young people to attract them to amateur radio. Could our Education Authorities be approached to allow us to stimulate interest by means of talks, and demonstrations of equipment such as shortwave receivers and simple transceivers? In addition we could have demonstration nights at our Institute branches, together with details. For example, in local council publications. Once interest has been established, we have the potential future members of the WIA.

Let me now comment on the current Novice licence. I believe that the examination is now more difficult than in the introductory stages, and this supports the introduction of the proposed Beginners licence.

Upgrading the current Novice licence to include segments of UHF is commendable. I consider that Novice licence holders have demonstrated their ability to observe the ethics and code of the amateur radio fraternity. I have not heard any abuse of privilege or questionable language during my time on the air.

The Australian Novice enjoys many more advantages than in some overseas countries. But upgrading of the Novice call at present is not only desirable in the eyes of the Novice, but could provide additional frequencies, particularly on 80 metres. The original area provided the Novice with sufficient frequencies to operate without problems, but widespread intrusion by transmitters from fishing boats, for example, has seriously reduced our available frequencies. I have heard as many as six of these transmissions concurrently. These transmissions seem to take place mainly in the Novice allocation. Thus I would support a possible extension of the 80 metre band for Novice operators.

Further, if we do not use all our allocated frequencies (full call operators, too), the authorities will find this an excuse to delete the available frequencies altogether. The 160 metre band is a typical example. Newer transceivers do not include 160 metres in their frequency range, and I firmly believe this band will ultimately be lost to us, unless it is used far more than at present. Perhaps consideration could be given to Novice use of this band.

I accept that the original intention of the Novice licence was to encourage the operator to eventually obtain a full call. This has been achieved by 70 percent of the original Novices, and speaks very highly of those who initiated the Novice call.

However, times have changed and some of us are getting too old to take on study for the full call. The remaining 30 percent, who have not upgraded would welcome a little more latitude.

As for Morse code, I feel that this must be retained at the present level. Eliminating Morse code would be a regressive step. Its loss would be equivalent to having a doctor of medicine unable to perform emergency surgery if required. If in a communications emergency Morse code was the only suitable available mode, it would be damaging to the amateur radio cause if operators had to admit inability to communicate by this mode.

I therefore strongly support the retention of Morse, not necessarily with the proposed new Beginners Telephony licence, but as being mandatory for a Novice or Full call.

I endorse the proposals of Messrs Linton and Harrison and commend them for the effective and concise manner in which they have presented their case. I hope that this letter will contribute to achieving their proposals.

Yours faithfully,

Ray Lower VK5NLL,
15 Wyatt Road,
Burnside, SA. 5066.
AR

THANKS FROM MEXICO

The Liga Mexicana de Radio Experimentadores, AC, after careful consideration, unanimously voted to present Sam Voron VK2BVS with the *Merito Amateuristico* as appreciation for the assistance given during the devastating earthquake in Mexico City on 19th September 1985.

Sam writes, *"Many Australian amateurs responded to the news of the Mexico earthquake disaster by relaying health and welfare messages for a concerned community unable to use any other means of reaching friends and relatives in Mexico City. This Award belongs to all who participated in these events. Thank you."*

STORAGE BATTERIES AND ELECTRICITY SUPPLY

Iron out the peaks in electricity demand, and power stations could be smaller, less expensive, more efficient — and rarer.

This is because, to be able to cope, power stations have traditionally been built with an installed, but mostly unused, capacity between 15 to 30 percent higher than periods of greatest demand.

The trick, therefore, is to not roster the consumer to cook dinner at a scheduled time, but to level the load internally at the station. Levelling the load is not as simple as it sounds — electricity is hard to store. But, faced with increasing costs and environmental pressures, utility companies world-wide are taking a serious look at batteries as one of the means of storing excess capacity in times of low demand and supplying it during peak periods.

Against this background comes the announcement from the USA of a joint venture between the Electrical Power Research Institute (EPRI) and the International Lead Zinc Research Organisation (ILZRO). EPRI is an association representing around 500 private and public US utilities (or more than 80 percent of US electric power production capacity), while ILZRO is the world lead industry's research arm; the proposal is to install and evaluate a 10MW/50MWh lead-acid battery for electricity supply load levelling. With similar ventures planned, or underway, in Japan, France, West Germany and elsewhere in the US, the EPRI/ILZRO program, it is hoped, will demonstrate and verify preliminary research which suggests the competitiveness of such systems compared to the capital and operating costs of additional combustion turbines.

This year will see the completion of planning and design work, with the fabrication of the battery, at a projected cost of US$3.5m, to begin later this year for installation and operation in 1988.

A significant amount of the 2 500 short tons of the lead required for the massive battery, equal in output to around 250 000 car batteries, will be contributed through their membership of ILZRO, by Australian lead producers.

Contributed by Earl Russell VK3BER from ELEMENTS, a quarterly review from ALDA/AZDA.

COMPACT DISC WITH MEMORY

Engineers at the JVC Research Centre are working to produce a compact disc with a memory that can store sounds, images and facts.

The disc looks like an audio compact disc, but has an added personal computer, television screen and a storage capacity 1500 times greater than a floppy disc.

Silent Keys

It is with deep regret we record the passing of —

MR E A BEAL	VK5NAB
3rd March 1986	
MR VERN BLACKMORE	VK5VB
26th December 1985	
MR ALBERT DUROSE	VK3DUR
MR HAROLD FISHER	VK5EX
11th March 1986	
MR ALBERT POELSTRA	VK4JAB
7th February 1986	

Obituaries

ALBERT DUROSE VK3DUR

On 23rd January, Albert Durose passed away suddenly.

Originally in the motor trade, Albert, some thirty years ago, joined the staff of Telecom and his interest in communication expanded, and he advanced to Senior Technical Officer 2.

During the late 70s, he studied with TAFE and obtained the Limited and Novice call signs of VK3XAS and VK3VTN. These were combined in the call VK3KBB.

A Full call followed — initially VK3DHO, which, in 1981, was changed to VK3DUR.

Although comparatively recently licensed, Albert was a very knowledgeable operator and further studies continued until his death. Meticulous care in construction was a characteristic and his antennas were models of precision.

Albert was a keen Freemason and when tragic fires and other disasters occurred and the Freemasons formed a Task Force to assist sufferers, communication was frequently needed and Albert was among the first to volunteer. His skill and equipment in providing communications were used in the Macedon area during Ash Wednesday.

He was a founding member of MARNET — the Masonic Amateur Radio Net and had joined in a similar net operating in America.

Albert's comparatively short life as an amateur had been one of interest, progress and above all service to radio and his fellow man. He will be sadly missed.

Eric Smith VK3CES
AR

HAROLD FISHER VK5EX

Harold Fisher VK5EX, of Renmark, a very private person, passed away on 11th March 1986.

Some 10 years ago, it became my privilege to contact Harold Fisher, and as Harold lived in Renmark, and I lived near Adelaide, personal contact was quite rare — we usually met when my wife Jeanne and I were on one of our "Safari's" to play golf and bowls in the Riverland.

*Harold's past is still rather vague to me, I only knew that he was confined to bed, which I understand was as a result of polio and he was forced to live in a controlled environment.

This impediment, and confinement did not in any circumstance, filter through to those he spoke to on-air. I really believe he was the most cheerful person one could wish to speak to — always bright, always an optimist, and invariably engaged in some amateur orientated project, which several friends aided by sending him circuits and radio bits and pieces.

Harold was an inspiration to those of us who are gradually facing "redundancy" — despite all his difficulties and restrictions, I can honestly say I never heard one word of protest or despondency. What an example in this modern world full of trials and tribulations!

For the past six years, fellow amateurs VK5s ZP; ACJ; AJN; AHK and VG, plus the author, have had an early morning sched with Harold on 80 metres, and Harold was always there first waiting for the early morning 'cheerio', and, as with many other contacts, he had in similar circumstances both local and inter-state, these daily get-togethers cemented a firm friendship, and I am quite sure could have in some small way, contributed to prolong Harold's tenuous hold on health.

Vale Harold — you will be sadly missed by those friends of yours in the amateur fraternity. You were a superb example of amateur comradeship and fortitude.

John Thompson VK5XT

* There may be factors in Harold's life that require amplification, and I invite further comment from those who may know more of Harold's early days.
AR

ALBERT POELSTRA VK4JAB

Albert lived in Bundaberg and was a very competent white stick operator. He passed away on 7th February 1986.

Albert obtained his Novice licence in mid-1983 and in later 1984 achieved his LAOCR All theory study was done using Braille and regulation were from tapes. He did not consider his blindness to be a handicap and showed great strength and determination while studying and could always find ways to overcome any difficulties he encountered.

He had been blind for 19 years as a result of disease and malnutrition suffered whilst a prisoner-of-war in Burma during World War II. Albert was one of the many prisoners who worked on the infamous Burma Railway.

He was a keen card player, using cards marked in Braille and enjoyed weaving cane baskets and other items. He exchanged tapes with his mother until the time of his death.

Albert's motivation was an inspiration to all who knew him and his cheery voice is sadly missed on the bands.

Sincere sympathy is extended to his wife and family.

Roley Norgaard VK4AOR, Graeme Whitehead VK4NYE and the VK4 Disabled Persons Radio Club, via Roley VK4AOR.
AR

VERN BLACKMORE VK5VB

Vern *(The Admiral)* Blackmore passed away on 26th December 1985, after a very long period of painful ill health. Vern was a Master Builder/Stone-mason and had worked on some of the most famous of Adelaide's buildings, including Parliament House.

He became interested in amateur radio in the 1950s, and as he did with all things, enthusiastically embraced his new hobby.

Having no formal training and a minimal education, Vern doggedly studied for the examination, passing first the *Limited*, and later received the call sign VK5VB in 1962.

A lack of technical training was compensated by a very determined experimental bent — Vern was a very active VHF experimenter, a pioneer in the use of Helical whips, and would entertain no other antenna than the Cubical Quad. One of these was a very prominent landmark in the Adelaide suburb of Klemzig for many years.

Vern's interest in amateur radio was to *pay off* in later years when severe diabetes forced his retirement from the building industry. He applied for and was accepted to the position of Radio Tradesman to WRE, where he translated his Stone- mason's discipline to produce beautiful electronic equipment.

His *nickname* came about during the Great Depression when, out of work he built a fishing cutter and supplemented the larder by fishing in St Vincent Gulf. I think all of his friends will remember the sailor's hat behind the wheel of the boat going to some exciting place.

Brian Warman VK5BI
AR

SOLAR GEOPHYSICAL SUMMARY — JANUARY

Solar activity was low and the Solar disc was without significant regions until the 13th when a region began to grow rapidly. This was associated with a sharp increase in the 10cm Flux levels, which peaked at 83 on the 16th. The region rotated over the west limb. On the 17th, Solar activity was again low, the disc without spots until the return of the region on the 30th. This brought another rapid increase in the 10cm Flux levels.

The 10cm readings for the month were: *1=69; 2=70; 3=71; 4=72; 5=73; 6=75; 7,8=74; 9,10=75; 11,12=74; 13=77; 14=79; 15=78; 16=83; 17=77; 18=76; 19=73; 20=72; 21,22=70; 23,24=69; 25,26=70; 27=69; 28=72; 29=73; 30=76; 31=79.* Average was 73,5 and the Sunspot average was 2,3.

The running yearly average was 16.9 for July 1985.

GEOMAGNETIC

1 January	The field was at mainly active levels until 1700 UTC and then unsettled. A=18.
7 January	The field was at minor storm level until 1400 UTC. A=25.
21 January	The field was at active levels between 1300-2100 UTC. A=18.
23 January	The field was at active levels after 0600 UTC. A=15.
25 January	The field was at mostly minor storm level. A=24.
27-30 January	The field became disturbed early on 27th and was at storm levels from 0900 to 1800 UTC, then active to storm levels for all of the 28th. It then subsided to unsettled levels on 29th and 30th. A=35, 33, 16, 14, 8.

Most of the disturbances in January were relatively weak, the exception being from the 27th until the 30th. During this disturbance, the active A index rose to 35 on the 27th and to 33 on 28th. This follows the 30-31st December event as part of a new recurrent sequence. A further severe disturbance was to be expected on 22-25th February.

The were eight days of A15 and over with the quietest days being 13 and 19th with A2. The average A over the past six months was 12.12.

Details next month of the event of 8th February, which produced an A of 298, believed to be the largest since the 60s.

From data supplied by the Department of Science IPS Radio and Space Services — January 1986.

AR

AUDIO CASSETTES

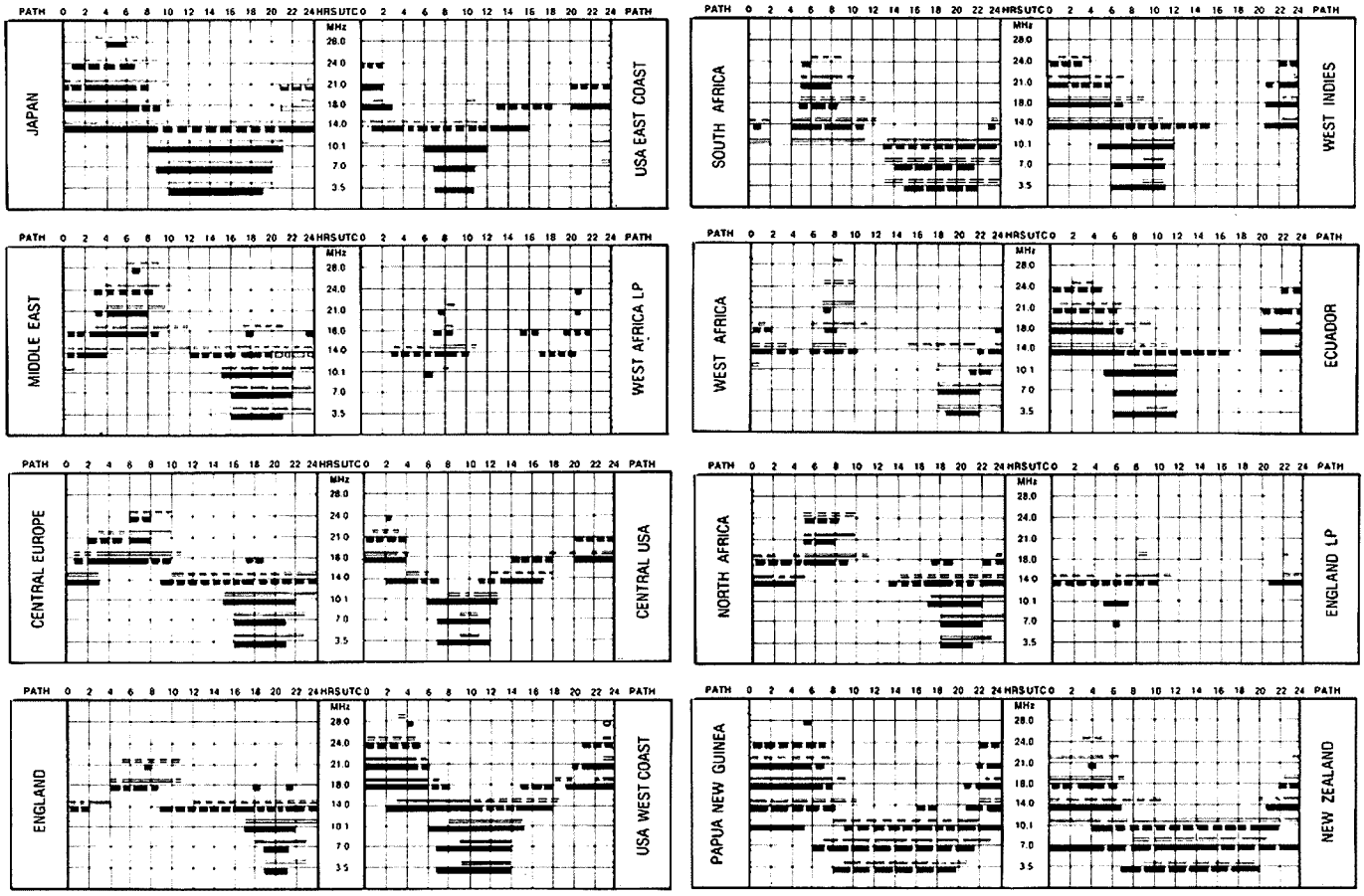
The standard audio cassette is due for a digital revolution with its size cut in half, up to two hours of taping capacity and a comparable purity of sound to the Compact Disc.

Engineers at JVC in Tokyo, are adding the final touches to the latest technological development — the Digital Audio Tape.

The Digital Audio Tape and Digital Cassette Recorders and Players could be available later this year.

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND

From Western Australia (Perth)

From East Australia (Canberra)

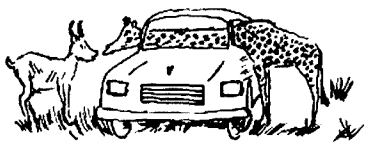
Better than 50% of the month but not every day (continuous lines)

Less than 50% of the month (short broken lines)
Mixed Mode Dependent on angle of radiation (long broken lines)

Paths unless otherwise indicated lie
LP = long path all paths are short path
Predictions reproduced courtesy of the Department of Science and Technology, Ionospheric Prediction Service, Sydney
All times in UTC

THOUGHT FOR THE MONTH . . .

Sometimes the message has to be blunt so you will see the point!



DEADLINE

All copy for inclusion in the July 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 23rd May 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted *from members who are* deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x 220mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). ***Closed for business during July.*** Agencies at: Geoff Wood Electronics, Rozelle, NSW Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

KENWOOD TS430S TCVR: In good condition. Also Icom IC-402 (70cm Portable). Jules VK2EXT. Ph: (02) 597 4562.

POWER TRANSFORMER: for FT101 tcvr. New or used, OR FT101 complete. Not going. Ray Price VK2AWQ, 26 Bay Street, Tathra, NSW. 2550. Ph: (0649) 4 1347.

ROTATOR: prefer heavy duty. Also rotator base for Ham Mil, mine is stripped. Ph: (062) 68 4561 BH or (026) 97 7263 AH.

TECHNICIAN: able to service my Drake TR7 tcvr & who resides in Sydney, NSW. Ph: (02) 84 7902.

WANTED — VIC

ATTENTION TO SERVICE TECHS — MOBILE RADIO: I need circuit diagrams & any relevant info for Pye Europa UHF tcvr Type MFSU/V/3. Unit ex-commercial use for amateur conversion. Cost reimbursed. All phone calls returned. John VK3IC, QTHR. Ph: (03) 744 2506.

CW FILTER FOR YAESU FT101 TCVR: X'tal filter number XF-30C. Also Front Plastic Panel trim that surrounds the dial & S-meter for Yaesu FT-101 tcvr. It is needed to replace a broken one. VK3OI. Ph: (03) 546 9219.

YM-38 DESK MIC for FT-707. Ralph VK3CQK, QTHR (VK3PYB). Ph: (058) 52 1372.

WANTED — OLD

MORSE KEYS: Early Morse keys, straight keys, bugs, ex-PMG/Military etc. Fred L40855, QTHR. Ph: (07) 396 3521 anytime.

FOR SALE — NSW

COMMODORE +4 COMPUTER: has built-in word processor, spread sheets, graphics & file manager. Would suit call sign sorting & electronic log book applications. $250 ONO. VK2AZT. Ph:(069) 42 1392.

DRAKE T4X — R4A: Combination 160-10m, C/w power supply & manuals. In VGC $450. Kenwood station monitor SM220 had very little use $320. Atlas RX110 rx 80-10m. GC $100. Ray VK2AWQ, QTHR. Ph: (0649) 4 1347.

DUMMY LOADS: 50 ohm oiled filled, 2 kW up to 500 MHz. $40. Postage extra (5 kg). VK2ZHR, QTHR. Ph: (049) 45 9373.

FT-290R 2m PORTABLE TCVR: mic, charger, nicads, manual — in immac cond. No mods, no bugs. $400. Kenwood TS-830S tcvr. MC 50 mic, 270 Hz CW filter, owner & w'shop manuals, spare valves. Mint cond. Def no mods, no bugs. $875. Max VK2GE, QTHR. Ph: (043) 92 4900.

KENWOOD R820 RECEIVER: all extra filters fitted very sensitive & full passband tuning. Kenwoods' best ever rx. Rare mint cond. $390. Tony VK2ECB, QTHR. Ph: (049) 2 5932.

KENWOOD TS-520 & EXT VFO 520: $325. Kenwood TS-820S & ext VFO 820. $525. VK2ACI, QTHR. Ph: (046) 64 1255.

PACKET RADIO C64: Program disc & modem PCB for Commodore 64. $48. TAPR User Group, 59 Westbrook Avenue, Wahroonga, NSW. 2076. Ph: (02) 487 1428.

PEIRCE SIMPSON SUPER BENGAL C/B: base station, integral power supply, ant tuning unit SWR meter, complete RIngo 29 MHz antenna. Can be used mobile. Good order condition. $220. Kenwood TS930 (93X) genuine factory & Tri-Kenwood Aust P/L unit. Late current series in mint condition. With hand mic, auto ant tuner, instr manuals, orig packing. Very low operational hours & a lop performer. $1750. Yaesu 102. Genuine factory production. Approx 10 hours tx operation. Fitted with Yaesu AM FM optional board, & complete with new YM38 desk mic, instr manual & orig packing. Purchased new 1310 — Sell $975. Jim VK2FIA, QTHR. Ph: (049) 46 7533.

VK2AXZ *FOOD* RECIPE COOK BOOK: for a worthy cause. Good value — not many left. Last opportunity. Send $2 (postage inclusive). VK2ATZ, Westlakes Radio Club, Box 1, Teralba, NSW. 2284.

YAESU FT-301 TCVR: 160, 80, 40, 20, 15 & 10m bands. AM/SSB/CW/FSK 100W PEP from 12V DC $240. Yaesu FP-301 mains power supply/loudspeaker (great for test-bench) $80. Also scanners: Bearcat 210 (30-50; 147-174; 450-470 MHz) programmable 240V AC or 12V DC, 16 channels. $80. Tandy 8 channel 240V xtal model (68-88; 147-174; 450-470 MHz) without xtals. $50. David Harvey VK2NWN, North Ryde. Ph: (02) 887 1913.

FOR SALE — VIC

ASACA B&W CAMERA: with variable lens, circuits & books. Also monitor. Used for SSTV or security watch. Mint cond. $350. Ph: (03) 725 9285.

ASHAI GUTTER GRIP BASE: Ashai base loaded ⅝ whip with RG58 coax sealed male connector. Perfect cond $35. Ph: (03) 82 4853 AH or weekends.

ASSORTED TRANSFORMERS: $8 each. BWD CRO 503 in excellent cond $140. Rotator Medium duty C400DS & control $160. Power supply, 7A cont, 10A peak, dual meters etc. $100. Heathkit IM-16 VOM $40. GDO $60. ATV Roadshow B/W camera rx tx & manual $170. ACX250B 150k & fans, bases, stacks, 803 & base $120 the lot. 2 x 5el beam. 6m or retune for 10m. Werner fittings. $100 each. Mal VK3KSA, 2 Thornton Court, Mooroolbark, Vic. 3138. After hours.

DIAWA CNA-1001 AUTO ATU: in VGC $280. Sanwa AT-45 transistor tester in VGC $20. Yaesu YM-38 mic $50. Kenwood MC-50 mic $50. D Smith 50 MHz freq counter AC/DC $60. Jeff L30409 QTHR. Ph: (059) 546 3940.

GALAXY 5 TCVRS: two units with PSs. One 230V & one 115V plus trnsfr. One of 12V DC PS. Quantity of spare valves. Servicing needed, but no time. Package $350. Ph: (058) 21 2705.

KENWOOD TS-520S: with MC35 mic, mint cond, minimum tx work, plus DG5 Display, manuals, orig owner. $550. VK3BZC, QTHR. Ph: (052) 63 1981.

SWAN 350 HF TCVR: 400W PEP. Works well $195. Graeme VK3AXDF, QTHR. Ph: (03) 277 3382.

FOR SALE — QLD

BENDIX BC-221 FREQ METER: good cond. Field model $45 ONO. Galaxy VFO Mark III. Good clean unit $30. Aztec DC/DC 12V-6/7/800V — Bias — 12V $10. Meters, 3 in .0/5A-0/150MA-0/5A. -0/1A-0/25MA. @ $3. Transf 400V/300MA $10. DO 400/0/400.300MA $10. DO fil 12V $3. Chokes 300MA $5. P/S 65V 30MA $3. Capacitors block type HV. 2MFD 1000VW $5; 4MFD 750VW; 2MFD 2000VW; 4MFD 1000VW; 4MFD 700VW; .002MFD 15000VW . . . $5 each ONO. W B Beslmann VK4LN, 43 Garrick Street, Gympie, Old. 4570.

ICOM 271: plus Mutek front-end $875. Icom 471A $875. 432/50 linear by Microwave $220. Cue Dee 17 el cross-Yagi (made in *Sweden*) *$190. Cue Dee 10 el cross-Yagi* (made in Sweden) $150. 7 metre tilt antenna mast $90. KR500 elevation rotator $225. CDE horizontal rotator (Auto) $90. Dressler masthead pre-amp plus Dressler interface $140. All equipment in top condition. Complete OSCAR Satellite Package $2855. Mike Haagsma VK4KCF.

OSKERBLOCK SWR-200: Power meter & SWR scales 0-20W, 0-200W, 0-2kW. As new in box with instructions $99. Swan Antenna Tuner ST-1. Will handle up to 2kW. Provision for balanced or unbalanced lines. Also input & output for PL259 50 or 75 ohm line. $135 as new. Keith VK4KS, QTHR. Ph: (07) 353 1968.

TOWER: 21 feet, tapered, heavy galvanised. Also included 20 feet galvanised water pipe for centre section $170. VK4AX. Ph: (07) 284 7319.

FOR SALE — WA

YAESU FT902 DM HF TCVR: Usual features plus all WARC bands; FM; single memory; digi readout; 12V/250V operation & manual. Top cond in carton. Throw in a five band vertical also. $750. VK6KFD, QTHR. Ph: (09) 342 8906.

EXCHANGE — VIC

TRIBAND HF CE-35DX BEAM: five elements with Wilson traps. Excellent VSWR & works well. Exchange for three element heavy duty tri-band. TH-3 Mark 2 or 3 or similar. Mal VK3KSA, QTHR after hours.

Advertiser's Index

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New for '86!

Quality DSE amateur kits give you the best at a fraction of the cost. Build it yourself and save!

70cm UHF Yagi Antenna

Excellent 13 element antenna. Lightweight, easy to install and doesn't require adjustment. Covers the 430-440MHz band. Impressive 12dB gain.

Cat K-6305

$39.95

VHF 2m Yagi Antenna

Wow! 9 element design and impressive 12dB gain really gets your 2m unit performing. And it's pre-drilled to eliminate tuning hassles, so you'll have it operational in no time.

Cat K-6297

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2m Linear Amplifier

All mode, high powered (120W max) linear amp that simply connects between your antenna and transceiver. Features pre-drilled case and heatsink. Covers 144-148MHz freq. range.

Cat K-6313

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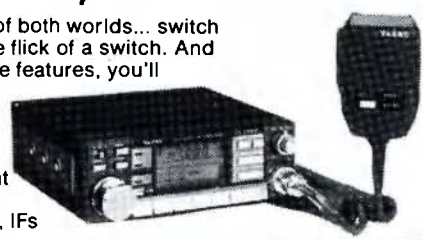
Two Receivers In One! Yaesu 2m/70cm FT-2700RH

Now enjoy the best of both worlds... switch from 2m to 70cm at the flick of a switch. And with a host of impressive features, you'll always be in control.

- 10 memory channels
- Priority scan
- Dual independant front ends
- Separate synthesizers, IFs and transmitter RF stages

Cat D-3515



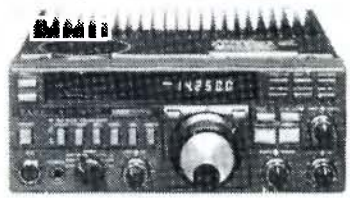
Was $1095

$975

Yaesu's Masterpiece the FT757GX

...''Without modesty, the best transceiver''. That's how Amateur Radio Action magazine described this superb radio! And when you consider the features, you'll see why. All mode AND all WARC HF bands are built-in. Provides 100W continuous power output on SSB/CW/FM. There are twin VFOs, 8 memories and Yaesu's famous IF shift/width passband control. Plus many other superb features which turn any amateur into a professional.

Cat D-2940



Was $1495

$1395

FRG-8800 SW Receiver

More than a receiver, it's a 'standard'... designed by Yaesu, the leaders in communications. Fully microprocessor controlled, with selectable IF and BW, its 10 built-in memories provide easier access to the 2MHz-30MHz range at the touch of a button.

Cat D-2821

$929

Hi Power 2m Hand-Held

The 2m transceiver that you've been waiting for! Combining base station power and performance in a convenient hand-held size for go-anywhere communications action! Features 10 memories for favourite repeater and simplex channels, precise keyboard entry for frequency selection, memory, etc... which are all displayed on the huge LCD display. Plus full scanning options: limits, memories and more.

Cat D-3505

Was $449

$399

HF Linear Amplifier

Extend yourself without straining the bank account. Ideal for both mobile and base applications. Delivers an impressive 100W plus output at only 4W input. Features 3 level RF power selection, advanced semiconductors and specially wound ferrite transformers for full HF band (2-30 MHz) operation without retuning.

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Hit The Road With A HF Whip

40 metre whip with adjustable tuning (no cutting involved), heavy duty stainless steel mount, RG58C/U coax and PL259 connector. Made by 'Mobile One', the leading Aussie manufacturer.

Cat D-4307

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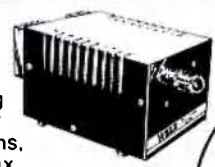
Fan Cooled Dummy Load

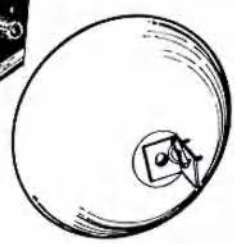
Coax termination for testing transmitters. Fan cooled for higher power levels. 50 ohms, 100W continuous/500W max. Frequency range: DC to 450MHz.



$149

Cat D-7020

Experimenter's Dish



Your entry into 'microwave' experiments! Easy to install, 50.8cm precision spun aluminium parabolic reflector provides high gain for optimum performace. Mounting hardware included.

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B.177/CW

ICOM IC-R71A

The Best Just Got Better

IC-GC4
World Clock

ICOM introduces the IC-R71A 100KHz to 30MHz superior-grade general coverage receiver with innovative features including keyboard frequency entry and wireless remote control (optional).

This easy-to-use and versatile receiver is ideal for anyone wanting to listen in to worldwide communciations. Demanding no previous shortwave receiver experience, the IC-R71A will accommodate an SWL (shortwave listener), Ham (amateur radio operator), maritime operator or commercial operator.

With 32 programmable memory channels, SSB/AM/RTTY/CW/FM (optional), dual VFO's, scanning, selectable AGC and noise blanker, the IC-R71A's versatility is unmatched by any other commercial grade unit in its price range.

Superior Receiver Performance. Utilizing ICOM's DFM (Direct Feed Mixer), the IC-R71A is virtually immune to interference from strong adjacent signals, and has a 100dB dynamic range. Passband tuning, a deep IF notch filter, adjustable AGC (Automatic Gain Control) and noise blanker provide easy-to-adjust clear reception, even in the presence of strong interference or high noise levels. A preamplifier allows improved reception of weak signals.

IC RC11
Infrared
Remote

Keyboard Entry. ICOM introduces a unique feature to shortwave receivers... direct keyboard entry for simplified operation. Precise frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency will be automatically entered without changing the main tuning control. Memory channels may be called up by pressing the VFO/M (memory) switch, then keying in the memory channel number from 1 to 32.

VFO's/Memories. A quartz-locked rock solid synthesized tuning system provides superb stability. Three tuning rates are provided: 10Hz / 50Hz / 1KHz.

32 Tunable Memories. Thirty-two tunable memories, more than any other general coverage receiver on the market, offer instant recall of your favorite frequency. Each memory stores frequency, VFO and operating mode, and is backed by an internal lithium memory backup battery to maintain the memories for up to five years.

Options. FM, synthesized voice frequency readout (activated by SPEECH button), RC11 wireless remote controller, CK1 DC adapter for 12 volt operation, MB12 mobile mounting bracket, two CW filters FL32 — 500Hz, and FL63 — 250Hz, and high-grade 455KHz crystal filter FL44A

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The World System

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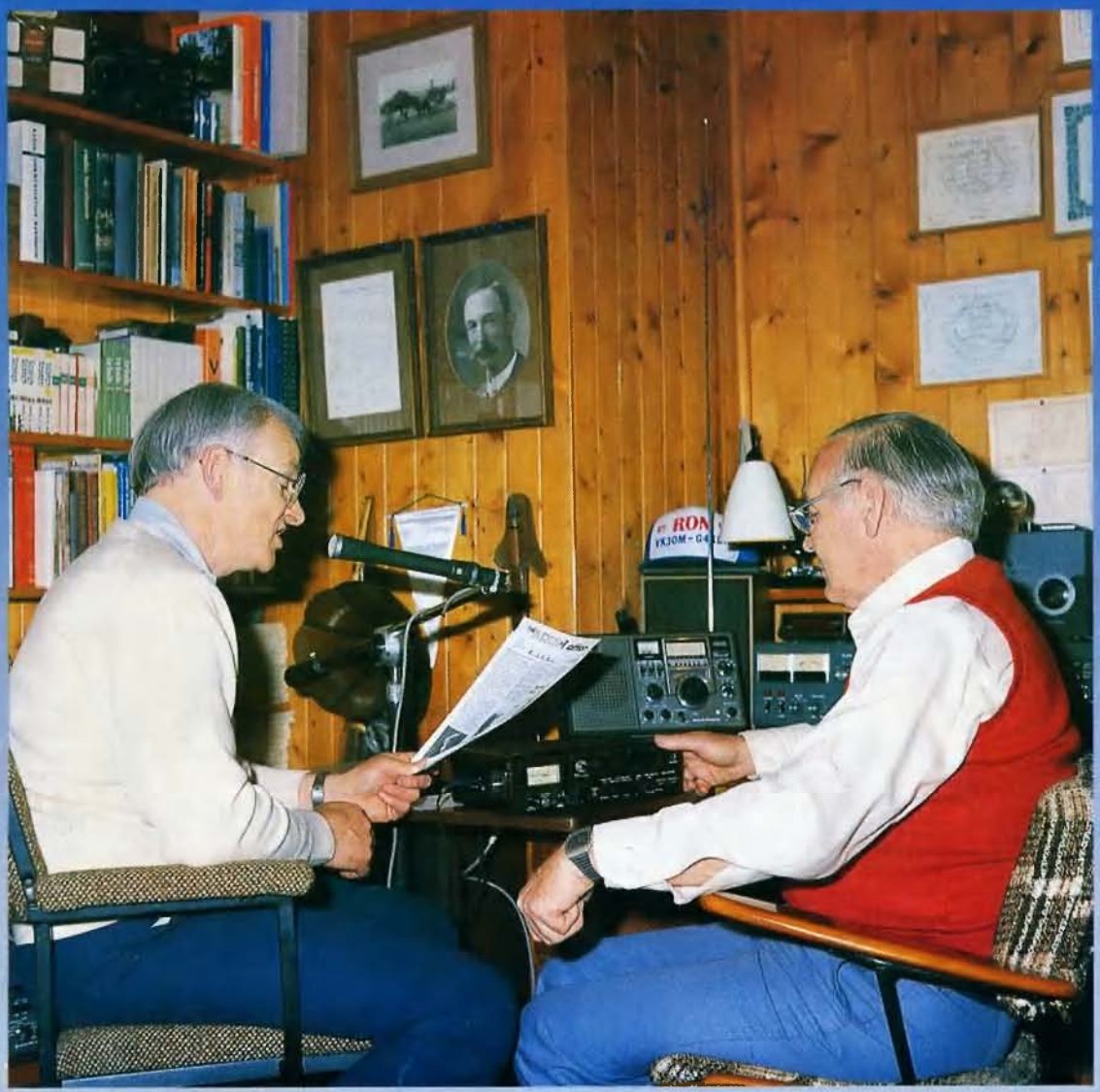
Amateur Radio

VOL 54, No 6, JUNE 1986

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



Did You Catch the Jubilee Train?

JOTA can be fun!

Novice Notes

Open Wire Feed Multi-Band Dipole

Construct

VFO with Digi-Readout

or

VFO for the FT-707

or

A Bracket to hold a Hand-Held in a Vehicle

Aerials to experiment with

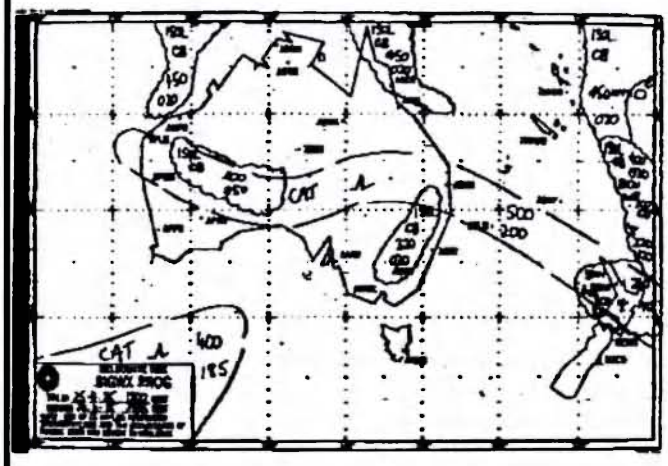
The Hentenna

Stepped Loop Antenna

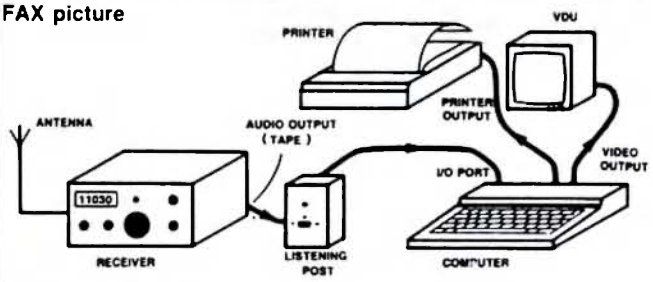
The Australian Electronics Monthly

USE YOUR COMPUTER TO RECEIVE

- Radio Facsimile Pictures (FAX)
- Radio Teletype (RTTY)
- Morse Code (CW)



FAX picture



Decode RADIOTELETYPE/RADIO FACSIMILE PICTURES &/or CW using your computer and the AEM3500 Listening Post project.

GET THE AEM3500 "LISTENING POST PACKAGE"

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By building the *Australian Electronics Monthly* AEM3500 'Listening Post', a simple add-on decoder project for your computer and receiver, and using our software, you can receive weather map transmissions, amateur RTTY and foreign news services, plus amateur and commercial Morse transmissions.

There's a whole fascinating new world out there among the non-speech transmissions that were just an annoying 'burble' on your receiver previously.

The package comprises:

- Comprehensive constructional and operational details. (Normally $8.80 the set)
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- Software on either cassette or diskette. (Normally $19.50).

All for only **$29.95** **save over $6!**

Including post & handling

* Components necessary to complete the project are widely stocked by electronics retailers.

COMPLETE THE COUPON NOW

(a photostat will do) and send us a blank C10 cassette or *formatted* disk to suit your computer.

- We will gladly re-record any software that doesn't run.

YES! Please rush me the AEM3500 Listening Post Package. Please supply software to suit the:

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Photograph by Ken McLachlan VK3AH

Bill Roper VK3ARZ and Ron Fisher VK3OM, producing the Federal Tapes Segment used for each Divisional Broadcast.

Technical Features

Special Features

Regular Features

Amateur Radio

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Make a date now. The 21st and 22nd June is your appointment to become involved in the 1986 Novice Contest (refer rules last issue, p41). Become involved and enjoy the fun, but remember to submit your log.

This month, a Stable VFO with Digital Read-out is detailed on page 10. This VFO uses available components (many of which can be found in the shack *junk-box*). It is simple, yet demanding in construction and with a little care, the satisfaction of completing such a project and using it is exhilarating.

There is also an External VFO for the FT-707 (p12), which fills a specific need for uses of this unit.

Two antennas are described, and one could be described a little *weird*. The Hentenna is an interesting small project and has proved most successful for its many users whilst the other is for users of all bands, but particularly the lower bands.

Novices Notes compliments the antennas with an Open Wire Fed HF Multi-Band Dipole and should be of interest to everyone from the DXer to the SWL.

Wondering where to go for your next holiday? Phil VK2BPC, had this problem and solved it by a trip to Norfolk Island. Phil gives an enthusiastic account of his DXpedition when he met with many of the resident amateurs on the Island and the joy he had operating with low power.

Don't miss Amateur Radio is Contagious — a tribute by an amateur to his father who nurtured him into the ranks of a marvellous hobby.

Jamboree on the Air is fast approaching and lots of hints are given from one who was led into the hobby by JOTA.

The cyclone season in the north of our vast country did not pass without a decent cyclone making its presence felt. A small article depicts how WICEN assisted during Cyclone Winifred.

(BKP)

DEADLINE

All copy for inclusion in the August 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 20th June 1986.

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At DSE, we're on the same wave-length as amateurs: value for money and performance you can count on!

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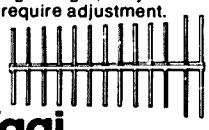
70cm UHF Yagi Antenna

Cat K-6305

Impressive 13 element beam with 11dB gain — and you build it yourself for a fraction of the price! Covers the 420-450MHz band for complete UHF action. Lightweight, easy to assemble and doesn't require adjustment.

$39.95

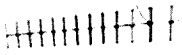


VHF 2m Yagi Antenna

You'll really get your 2m working with this brilliant 9 element beauty with its 10dB gain. Comes pre-drilled — so there's no setting up hassles to delay you!

Cat K-6297

$89.95



Get those distant repeaters!

A powerful, all mode 2m linear amp like this would cost a fortune... but as a DSE kit, you save $$$! Easily connects between antenna and transceiver. 13.8V makes it ideal for mobile and base use. Freq. coverage: 144-146MHz. Insertion loss: 0.6dB. Input VSWR: <1.2:1. Up to 120W output (with 15W in).

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Duplexers

Connect two radios, 2m and 70cm, to one antenna. Save time, trouble and the mess of having more than one antenna. Choice of two Maldol duplexers: 145/435MHz and 50/144MHz. Both lightweight and compact: 45x65x30mm. Impedance: 50 ohm. VSWR: <1.2. Insertion loss: <0.5dB. Max. power: 50W

145/435MHz **$49**

Cat D-3550

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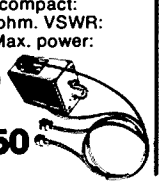
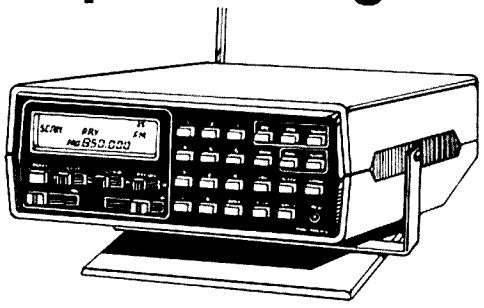


Stop searching for another scanner!



Now Save $100!

Everything you could possibly want in a mobile scanner IS in our brilliant **MX-4000**. Full access to 20 channels, covering 8 bands... including Air, up to 800Mhz. Features priority control, scan and search PLUS full display messages. And with an optional power supply it doubles as a powerful base station. Comes with rechargeable NiCad battery pack.

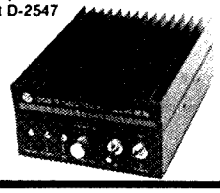
Cat D-2818

WAS $599 **$499**

HF Linear Amp

Powerful broad-band, bi-linear amp you can afford! Delivers over 100W with only 4W input. Advanced semiconductors and ferrite transformers for operating over the entire HF band (2-30MHz) without retuning. Three level RF power selection makes it ideal for mobile and base use. Power supply: 13.8V DC, 15A drain for 100W output; 20-25A peak for 200W PEP output. Input/output impedance: 50 ohms nominal. Output: 100W nominal, 180-250W PEP.

Cat D-2547



FAMOUS TOYKO-HY POWER BRAND

$499

2m GaAsFET Preamp

SAVE $20

For hi gain, lo noise!

Just what the Doc ordered for increased 2m performance! Covers 144-148MHz band. Brilliant 20dB gain and 0.8dB noise index. VSWR: <1.5:1. Intercept point: 15dBm. Supply: 8-15V. Features BNC connectors. Cat D-2956

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Yaesu FT203R 2m hand held

A little beauty that does the job without all those expensive extras. But it still performs better than most. Covers 144-148MHz range; thumbwheel frequency selector for easy operation — and no memories required! 2.5W output (5W input) for average repeaters and simplex. Doubles as a 'mobile': VOX hands-free system with optional headset. Measures just 65x34x153mm, weighs 450g with battery.

Cat D-3500

WAS $399 SAVE $50 **$349**

Versatile 2m mobile with real performance

SAVE $100 WAS $749

Think of what you want in a mobile... and Yaesu's FT-270R has it! Two microprocessors, 10 memories, dual VFOs and exceptional scanning facilities that let you take on 2m pile up and win. 25/3W power output for city and bush action. Measures 140x162x40mm — small enough to go anywhere.

- **Unique die-cast, duct-flow heatsink**
- **Amazingly small**
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B.190/JL

Photograph by Fang Shaochu from China Reconstructs

The First Radio Group.

CHILDREN'S DAY

International Children's Day, 1st June, will see the amateur radio station of the Chinese Radio Sports Association (CRSA), together with the Beijing, Shanghai and Sichuan stations, participating in a festival for young amateurs.

These amateurs, mostly school students around 14-years of age together with a few primary school children around 10-years have been invited to operate the transceivers and send festival greetings to children world-wide. These greetings will be sent in English.

Last year, in a little over an hour, more than 70 stations had been contacted. Amateurs in the USA, USSR, Japan, Canada, India, Brunei and Hong Kong expressed their delight in contacting the young Chinese amateurs.

China began amateur radio communications in the late 1920s. The first amateur station of New China, BY1PK, was established in 1958. By 1966, six stations were established in the country, however, during ten years of cultural revolution all radio operation ceased. In March 1982, the CRSA station resumed operation with overseas stations.

With BY1PK, the stations of BY4AA, BY8AA, BY5RA and BY1QH are experimental bases for radio communication research and *cradles* for nurturing young radio specialists. Some children's palaces, scientific research station, universities and colleges plan to set up amateur radio stations to meet the needs of the young amateurs.

Building small transistor receiver sets has long been a popular past-time with Chinese children, but it has only been in recent years that transmission has also become involved.

BY1SK is located in the Children's Science and Technology Centre of Beijing's Zuanwu district and has a radio group of around 24, chosen from applicants from middle and primary schools in the district. They attend the centre twice weekly to study English and to practice Morse code. The group is in the care of instructor Gong Kelu, who participated in radio activities when he was in middle school.

Mastering Morse and studying English involves a lot of hard work and occasionally the children become bored and want to *drop-out*. On these occasions Gong Kelu relates a story of a young telegrapher during a disastrous earthquake in the city of Tangshan, during 1976. Though he had been badly injured in the first shock, he rallied his forces and when other communication lines lay in rubble, he managed to keep in communication with Beijing so that the central government could plan rescue efforts. This helps the children see how important the skills they are learning really are.

Youngsters from the group are assigned to be in charge of radio communications in the city of Beijing during summer camps and sports meets and have been highly praised for their good work.

Adapted from China Reconstructs, October 1985 which was contributed by John Brennan VK4SZ

ar

Cartoon from PUNCH magazine and contributed by Ivan Huser VK5QV

Visitor: "How nice for him! Now he can listen to all the best music."
Mother: "Yes — and it is so good for his ears — they did stick out so." — 1923

Editor's Comment

MORE TUB THUMPING!

I note in last month's issue that another member is taking me to task over the desirability of all amateurs belonging to their national society. He suggests that the individual non-member can still exert an influence on the political processes by which our legislative controls evolve; that the *lone wolf* can still have a political effect.

With respect, I am still forced to hold the opposite opinion. I have had experience over many years with various WIA committees assembling information on which negotiations can be based. Mostly such negotiations are with DOC or other Federal departments, but may also be with other societies, with IARU, or at Divisional level, with State or local government authorities. They may also be submissions to independent inquiries.

In some cases individuals, as well as the WIA, have put forward their ideas, for example by letters direct to Ministers. Usually it has been plainly obvious that individual opinions which do not reflect popular concepts will be politely, but effectively, ignored. Faced with the task of establishing a consensus acceptable to the majority, a Minister (or his advisers) can only take as a representative view that which is proposed by a representative body.

Frequently the WIA is asked by DOC what is our opinion of this or that individual submission. Clearly, the fact is that Government bodies do not have the time, or the inclination, to piece together a fragmentary jigsaw of individual letters. An organisation representing the majority of concerned individuals fits much better into the political system. If you want your view-point to carry the maximum of political weight, make it clear to your Institute first.

Arguments like these have been used by unions and associations of all kinds for decades. Few people will seriously disagree with them. But do not let us confuse them with other arguments sometimes raised in favour of compulsory unionism. There are some countries where you cannot get an amateur licence until you have joined the society. The society may even examine for, and award, the licence. Membership in those countries really is compulsory.

Our Australian tradition of *rugged individualism* has prevailed for many years over some who might favour compulsory membership. The WIA has no wish, nor could it have the power, to compel *lone wolves* to join. But our aim, as far as we possibly can, is to make the Institute so essential and attractive to Australian amateurs that none would wish to be outsiders!

Bill Rice VK3ABP
Editor
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THE HENTENNA

Tadashi Okubo JH1FCZ (ex JA2EP)
5288 Kuruhara, Zama, Kanagawa, 229, Japan

Many Japanese amateurs have been worked in Australia using about 10 watts of power and the Hentenna antenna. Their signals are always quite readable.

The *Hentenna* was developed several years ago by members of the Sagami Club and was introduced to the hand-made mini-magazine, *The Fancy Crazy Zippy.* In January 1977, it was printed in the magazine *Radio No Seisaku.* It has become very popular with young people on 50 MHz.

This antenna was not developed by any antenna technicians but by radio amateurs through their experimentations. This is a real *by the amateurs, for the amateurs, of the amateurs antenna.*

Recently, many people in Japan have been working DX on HF with the Hentenna, with two people completing WAC on 28 MHz using it.

LET'S MAKE THE HENTENNA

Many may think it a very strange name for an antenna but **HEN** means *weird* in Japanese. So let us see what is weird about it!

Figure 1 is the basic diagram of the Hentenna. It is half a wave length high and 1/6 of a wave length wide. It produces horizontal polarisation. If you know a little about antennas, you may have thought that a vertically polarised wave would be produced. This is the first weird thing about the Hentenna.

called a *Hat Hentenna.*

Have you ever heard of such a weird antenna? Hentenna is the weirdest antenna of all the antennas in the world. But it also has other characteristics besides it weirdness.

CHARACTERISTICS

Hentenna's structure is simple. Setting up, adjusting and dis-assembling can be done in a short time. This makes it ideal for use as a portable antenna.

Mr Shirtoto JA7QFB, uses a portable Hentenna. It takes him only two minutes to set-up and one minute seven seconds to dis-assemble. This is very helpful in case it suddenly begins to rain or if there is lightning. Plus it is very easy to move around. You only require to carry the pole and some other small accessories. It is very light weight compared to the four and five element Yagi antennas.

There is no problems in a wind as the wind can just blow through it.

Hentenna's propagation pattern is a figure eight pattern so it is wrong to say that Hentenna is non-directional. But it has more gain than a dipole, so it can be called non-directional. It is unnecessary to rotate Hentenna, just erect it on the roof as you would a television antenna, without a rotator.

But, on the other hand, as it does have a figure eight pattern with no transmission or reception towards the sides of the antenna, the front to side ratio is very good.

LET'S MAKE IT YOURSELF

There are three ways to make the Hentenna. One is to make the element with wire and the frame with something like bamboo or wood. The easiest method is shown in Figure 6a.

Another way is to use aluminium pipes for the top and the bottom elements, and wire for the sides. This method is shown in Figure 6b. This is a very useful, portable antenna.

The third way of constructing a Hentenna is to make all the elements of aluminium pipes (Figure 6c). In this way, you can make a Hentenna which is suitable for 144 or 430 MHz.

Any of the three methods described above may be used, but the easiest method is explained here.

Set up the frame as in Figure 7. The frame needs to be very strong, so it is advisable to make it with wood, bamboo or aluminium pipe.

Connect both ends of an eight metre length of stranded wire to make a circle. It is okay to use a solderless terminal to link them together, but it is preferable to solder the join. It will be necessary to allow a little more than the eight metres specified for a soldered joint.

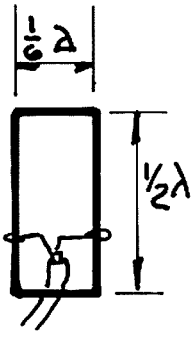


Figure 1.

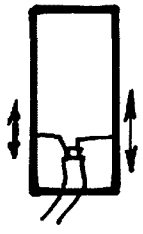


Figure 2.

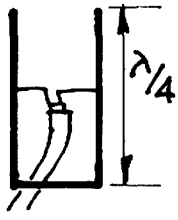


Figure 3.

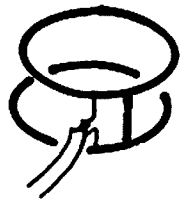


Figure 4.

The next thing is that it is not really necessary to make it half a wave length high and 1/6 of a wave length wide. You can make it a little fatter, thinner, taller or shorter. It still works well. A five to ten percent difference will not matter much. Mr Ota JI1CCH, made a 3.5 metre high Hentenna for 50 MHz. It still worked very well.

The third thing is the way the SWR is adjusted. Figure 2 shows how to adjust the SWR. The feed point is moved along the element and fasten it where the SWR is the lowest.

It has additional weird characteristics. It has as much gain as the Yagi antenna, though it is much simpler. (Technical Editor's Comment: Antenna Gain claims should always be taken with a grain of salt. Particularly unsubstantiated claims). DX QSOs by ground wave have been made with the Hentenna.

Moreover, one amateur used the Hentenna with a 1.5 watt SSB transceiver to QSO between Izu Peninsula and Tokushima, a distance of about 450 km. This is unbelievable and also impossible with a dipole antenna.

Now, what if you cut the Hentenna in half? It still works! This is called a *Fork Hentenna,* see Figure 3. What if you make it round as shown in Figure 4? It still works, also! This one is

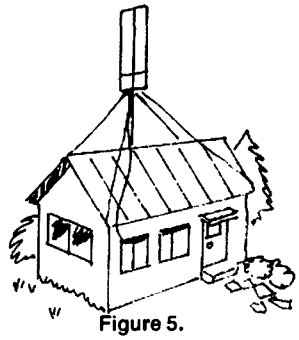


Figure 5.

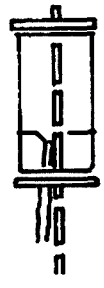


Figure 6 a.

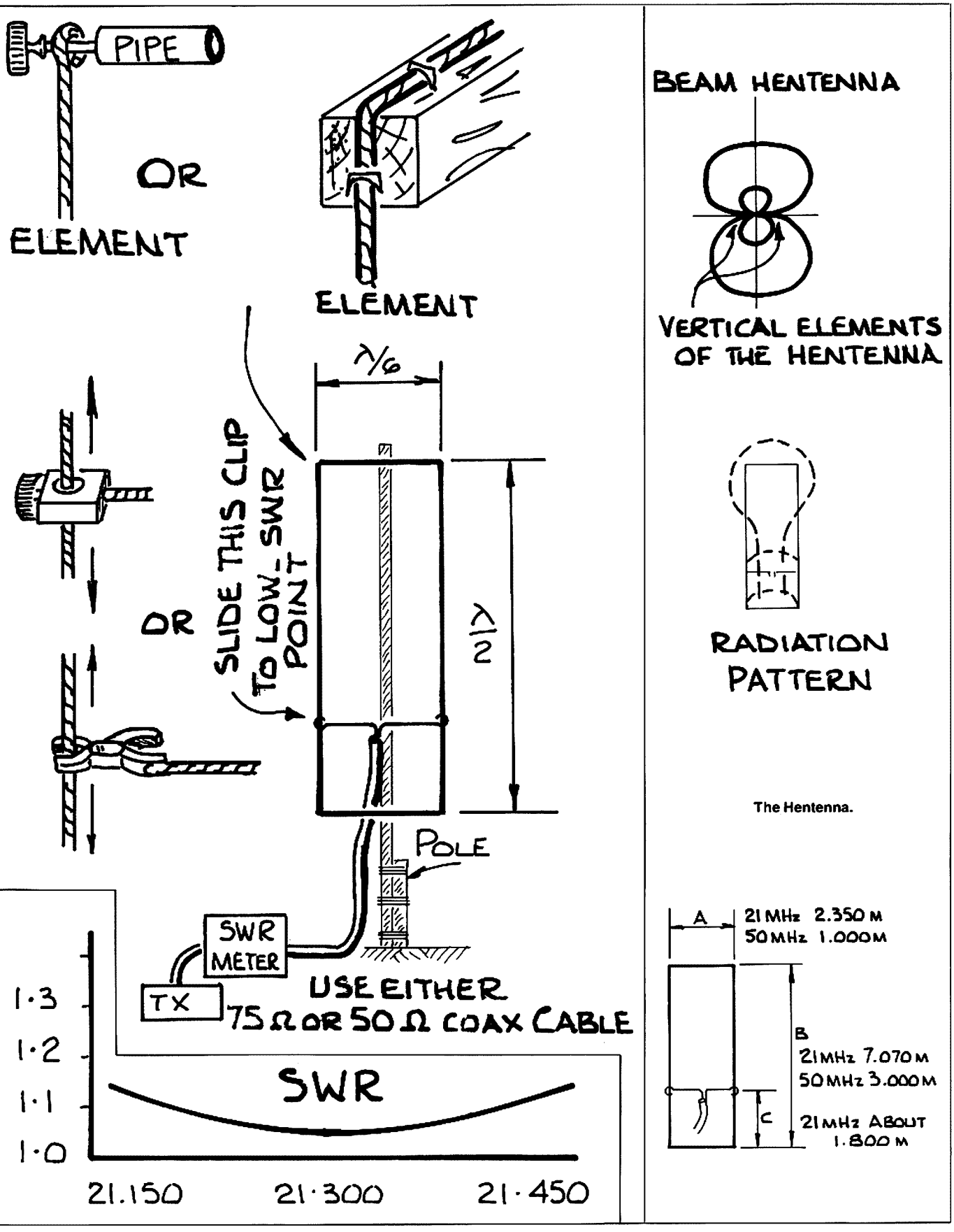
Figure 6 b.

Figure 6 c.

The wire element, just made, has to be fastened very tightly to the frame with some strong twine or polyvinyl chloride wire. *See!* It is beginning to look like a Hentenna! ! !

The coaxial cable can be either a 3c2v or 5c2v 75 ohm series or a 3D2v or 5D2v 50 ohm series cable. RG58U is also acceptable.

Connect the coaxial connector to the coaxial cable as shown in Figure 14.



The Hentenna.

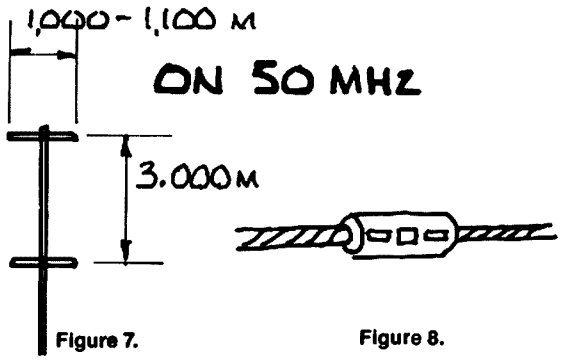


Figure 7.

Figure 8.

Figure 9.

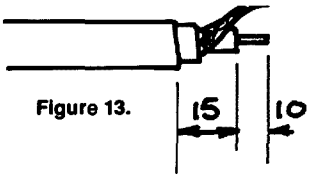


Figure 13.

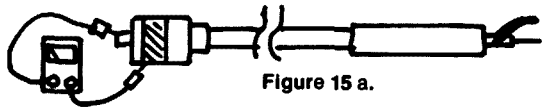


Figure 15 a.

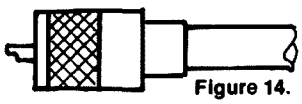


Figure 14.

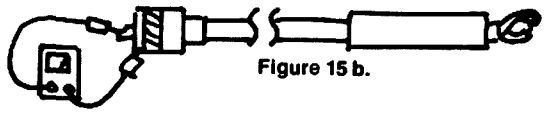


Figure 15 b.

When the cable is connected make a continuity test on the insulation and centre wire to ensure that there are no shorts.

Connect 70 cm of tinned antenna wire to a eight pin terminal board as directed in Figure 16a. Solder the coaxial cable to this and secure it with tinned wire or similar. (Figure 16b).

Temporarily, set up the Hentenna in your chosen location. Find the point of the element where the SWR is at its lowest and mark this point.

Take the Hentenna down again and solder the feeder to the marked points.

There! Wasn't it easy? The only thing remaining is to erect it and steady it with guy-wires.

Presented by Kazunobu Nagatsu JK1IZF, 3310-1 Hei, Toyooka-town Mitsukaido-city, Ibaraki, 303 Japan and contributed by Ron Mills VK5XW.

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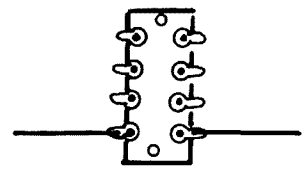

Figure 16 a.

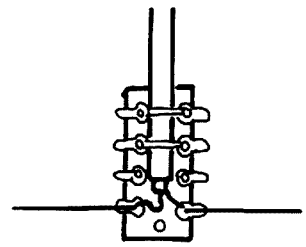

Figure 16 b.

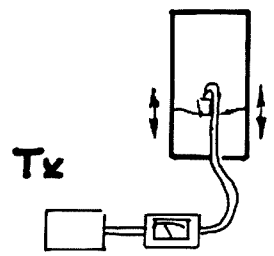

Figure 17. SWR METER

Be part of the fun during the 1986 Novice Contest
But please remember to submit your log to the FCM

PARASITIC BEAM PROGRAM FOR COMMODORE 64

Joseph Ortuso VK7NJO
43 Bayfield Street, Bellerive, Tas. 7018

The following program enables measurements to be calculated for a three-element beam.

With this program you will be able to find out measurements for a three element beam for any frequency between 20 and 10 MT.B choosing any spacing between .1 to .30 wavelength.

It will also give approximate impedance at the feed point.

All the measurements are given both in imperial and metric.

An impedance matching system will still be required and final tuning adjustment will still be needed. In other words, all the rules in putting up a beam still apply.

The listing is pretty straight forward and in line zero you may wish to alter the screen colours. It is now set for my monochrome monitor. You will find the whole program is pretty well formatted.

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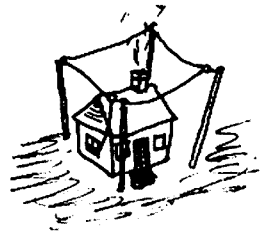
```
0 POKE53280,4:POKE53281,4:PRINT"■"
5 PRINT"□"
10 PRINT"     *** PROGRAM BY JOSEPH ORTUSO***"
20 PRINT"              FOR COMMODORE 64":PRINT
30 PRINT" A PROGRAM TO CALCULATE DIMENSIONS FOR A 3 ELEMENT PARASITIC BEAM"
40 FORI=1TO40:PRINT"-";:NEXTI
50 PRINT" USE 1.5 INCHES OF O.DIAMETER TUBING      FOR 20 MT."
60 PRINT" AND 1 INCH OF O.DIAMETER TUBING          FOR 15 MT. AND UP":PRINT
70 PRINT" THE FORWARD GAIN FOR VARIOUS SPACINGS    IS BETWEEN 7.5 AND 8 DB."
80 FORI=1TO40:PRINT"-";:NEXTI
90 INPUT" WHICH FREQUENCY (MHZ) ";F:PRINT
100 PRINT" WHICH SPACING":INPUT".1 .15 .20 .25 .30 OF WAVE/L.";S
110 IFS<>.1ANDS<>.15ANDS<>.20ANDS<>.25ANDS<>.30THENPRINT"INVALID ENTRY":GOTO100
120 REM A=DRIVEN,D=DIRECTOR,R=REFLECTOR
130 IFS=.1THENA=474.5:D=465:R=500:H =15
140 IFS=.15THENA=472.8:D=460:R=496:H=20
150 IFS=.20THENA=470.5:D=452.5:R=490:H=30
160 IFS=.25THENA=468:D=442.5:R=484:H=48
170 IFS=.30THENA=467:D=435:R=480:H=80
180 A=A/F:D=D/F:R=R/F:X=0.305
190 A1=A*X:D1=D*X:R1=R*X
200 W=30000/F
210 W1=W*S/100
220 W2=W*S/100/0.305
230 PRINT"□"
240 PRINTTAB(12)"ELEMENT LENGTH":PRINT
250 PRINT" FOR";F;"■MHZ. AND";S;"OF WAVEL. SPACING"
260 FORI=1TO40:PRINT"-";:NEXTI
270 PRINT" DRIVEN EL."
280 PRINTTAB(6) A;"FT OR";A1;"MT":PRINT
290 PRINT" DIRECTOR"
300 PRINTTAB(6) D;"FT OR";D1;"MT":PRINT
310 PRINT" REFLECTOR"
320 PRINTTAB(6) R;"FT OR";R1;"MT"
330 FORI=1TO40:PRINT"-";:NEXTI
340 PRINT:PRINT"THE SPACING IS" ;W1;"MT"
350 PRINT:PRINT"OR.....";W2;"FT":PRINT
360 PRINT"RADIATION RESISTANCE IS APPROX.";H;"HOMS"
370 FORI=1TO40:PRINT"-";:NEXTI
380 PRINT"  WOULD YOU LIKE TO COMPUTE AGAIN? Y/N"
390 GETA$:IFA$=""THEN390
400 IFA$<>"Y"ANDA$<>"N"THEN380
410 IFA$="Y"THENGOTO5
420 IFA$="N"THENPRINT"□":END
```

STEPPED LOOP ANTENNA

On the lower frequency amateur bands, particularly 160 and 80 metres vertical polarisation is often desirable, but usually difficult and expensive to obtain.

Bruce Hannaford VK5XI
57 Haydown Road, Elizabeth Grove, SA. 5112



A large horizontal loop antenna is a good all band antenna but certainly lacks in vertical polarisation as needed on these bands. To a considerable degree the stepped loop corrects this deficiency and this stepped design could also be applied with advantage to horizontal dipoles as well. For additional general information regarding the horizontal loop antenna see Amateur Radio, December 1984, but correct two measurements shown in the first column, 28 metres should be 18.2 metres and 112 metres should be 73 metres.

The stepped loop is based on the idea that even a very short vertical section in a high current, high radiation portion of an antenna will give a considerable amount of vertically polarised signal. Actually, in any vertically polarised antenna there is not much point In keeping the low current, low radiation portion going straight up often at great expense. This is born out by T and L type antennas where much of the low current portion is horizontal. It is also clear that even a small vertical section can be very useful when we consider loaded vertical whips often only a metre or two in length.

Now for some basic facts about large horizontal loops. The loop is normally a full wave-length on the lowest frequency band to be used. The length required is roughly equal to a wave-length in space (no end effect). Metres length = 300 divided by frequency in MHz. The loop will give a fairly low impedance feed point on *all* multiples of its fundamental full wave frequency. At the fundamental, the impedance will be about 100 ohms and as the harmonic number is raised the impedance will become higher until it is about 200 ohms at the eighth harmonic. The vertical radiation pattern of a purely horizontal loop (no steps) is largely straight up at its fundamental frequency but as higher harmonics are used this vertical angle becomes lower. The horizontal radiation pattern when the loop is fairly close to the ground gives good all round coverage. The shape of the loop is not very important so long as a large area is enclosed, a circle would be ideal, a square is a good reasonably close compromise that needs only four poles to support it. Great heights are not needed and if used tend to make the horizontal radiation pattern break up into lobes instead of being omni-directional. I have heard of the loop being used with good results only about a metre above ground, however I recommend enough height to be reasonably clear of any obstructions. The loop is a broadly resonant antenna which is also very useful. The loop usually gives a noise reduction when compared to horizontal dipoles. Apparently, the noise is largely shorted out in the loop.

Looking at the diagram of the square stepped loop, it will be noticed that the feed point is in the centre of one of the vertical sections and this is the best point for it. However, the bottom of the vertical section is a more convenient position and can be used if the maximum of vertical polarisation is not used. As the poles form a square they are in the correct positions to support vertical sections that will be at current maximum points. At the fundamental, full wave frequency, just as in any full wave antenna, there will be two current maximum points a half wave apart. In our case, at the feed point and in the opposite vertical section. On the second harmonic (x 2 frequency). There are two wave lengths in the loop and four current maximums, one occurring in each vertical section. As higher harmonics are used, some current maximums will occur in the more or less horizontal parts of the loop, however, in all cases, four of the maximums will be in the vertical sections. This means the maximum of vertically polarised signal will occur in the lowest frequency bands and the least in the highest frequency bands, which is the way we would want it anyhow. If an ideal square shape is not possible at your location you can make do with two or even one vertical section and still gain some advantage. Remember that the feed point and the opposite part of the loop are always current maximums. Current maximums are located by measuring along the wire from the feed point and not across the ground, a good point to remember if your loop is not perfectly square.

The height of the vertical sections depends on your pole height and clearance from obstructions and also on how much vertical polarisation you want, there is no magic figure. If you use large vertical sections, the horizontal sections will, of course, be reduced in length and the loop will have a smaller enclosed area. Carried to extremes, this will reduce efficiency. For an 80 metre fundamental loop I suggest at least one metre and up to about three metres in each vertical section. Of course, the stepped loop will require somewhat less ground area which can be very useful in many cases.

To tune the loop, a dip meter reading is taken at the feed point and the most convenient pruning method is to change the length of the vertical sections slightly, leaving the horizontal sections and pole positions unchanged. Check not only the fundamental, nut also the harmonics of interest, prune for best average results.

There are a number of options regarding feeding the loop. An open wire or 300 ohm feeder can be used with a balanced ATU. A 4:1 balun can be located at the feed point and then 50 ohm coaxial cable run to an ATU and the transceiver. Use a high power balun as the SWR may be fairly high on some bands.

Or the Antenna Matching Unit (AMU) described in *The Feeder Tuned Antenna* article in Amateur Radio, November 1985, could also be used.

The loop may be earthed at the mid-point of a balanced feeder system or at the mid-point of the vertical opposite the feed point. The above two methods give a balanced system but good results can also be obtained using unbalanced systems such as feeding the antenna with coaxial cable, the shield of which is earthed. The SWR will be much higher than with a 4:1 balun but most ATUs will manage it quite well. The balanced system is probably preferable but I have not been able to detect any difference in signal strength or received noise level with any of these methods at this location.

The poles used should preferably be wood or metal with added wooden tops so the vertical sections are not parallel to and close to metal masts. I am using the latter but the wood sections are not long enough to accommodate all the vertical radiator section lengths so a short horizontal wooden arm has been added to the metal pole to space the bottom end of the vertical wire well away from the metal pole. I have used two egg insulators at the top and bottom of each vertical section of the antenna to support the loop.

I have been experimenting using this loop on 160 metres and getting promising results. On 160, the loop is a half wave long with a high impedance feed point and one current maximum opposite the feed point. The loop can be fed with one feed point earthed and the other connected to a random wire type ATU. As a current maximum occurs in the vertical section opposite the feed point, a fair amount of vertical polarisation occurs and although one side of the feed position is earthed, this carries very little RF current and no earth mat etc is needed. The best method I have used so far has been to series tune the loop with a capacitor and 1:1 balun in series then a 50 ohm coaxial cable to the transceiver. As I said, the results are quite good, both on receive and transmit and the system is well worth further investigation.

In conclusion, I am sure this stepped loop system is a good answer for those who need a good all-band antenna, horizontal loop antennas are worthy of much more attention than they presently receive. I would be interested to receive feedback re the stepped loop especially concerning its reduced noise pick up performance.

ar

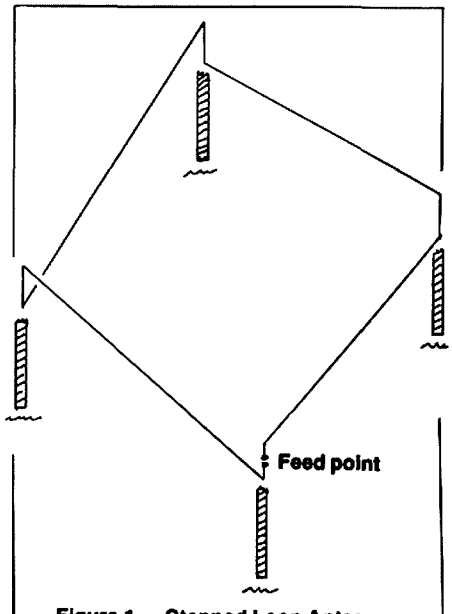


Figure 1 — Stepped Loop Antenna.

For simplicity sake tops of poles are not shown.

EMISSION MODES — What they mean

Peter O'Connell VK2EMU
3A Algernon Street, Oatley, NSW. 2223

Everyone knows (or should know) what AM, FM, CW, SSB etc means, but now emission modes are listed as a series of numbers and letters.

A look at page 115 of the recent Call Book lists the emission modes for the amateur radio service in groups of mixed numbers and letters. At first glance, the codes appear to be very complicated, but on a closer study it is easy to understand. Each code group has either seven or nine digits.
— eg 6K00A2B, 4K00A3EKN, 36K0F3E, 11M0A3FMN.

The first thing we need to do is to split the code groups into two or three sub-groups. The seven digit codes are split into two sub-groups, while the nine digit codes are split into three sub-groups.
— eg 6K00 A2B. 4K00 A 3E KN

The first sub-group contains four digits — three numbers and one letter.
— eg 200H 6K00 6M25.

This sub-group gives details of the bandwidth of the mode. The only letters used in the amateur service are H, K and M; which stand for Hertz, Kilohertz and Megahertz and occupies the position of the decimal place.
— eg 200H = 200Hz, 6K00 = 6kHz, 6M25 = 6.25MHz etc. (See Table 1 for full list).

The second sub-group contains three digits — two letters and one number.
— eg A1A A3E H3C J3C

The first digit, a letter determines the type of modulation of the carrier.
A = Amplitude modulated carrier — double sideband.
H = Amplitude modulated carrier — single sideband full carrier.
J = Amplitude modulated carrier — single sideband suppressed carrier.
(See Table 2 for full list).

The second digit, a number determines the nature of the modulating signal.
1 = Single channel digital information without modulating sub-carrier.
3 = Single channel containing analogue information.
(See Table 3 for full list).

The third digit, a letter determines the type of information being transmitted.
A = Telegraphy — for aural reception.
C = Facsimile.
E = Telephony.
(See Table 4 for full list).

The last sub-group contains only two digits, both letters. This sub-group provides additional information to describe the mode.
— eg KN MN NN.

The first letter defines details of the signal.
K = Sound of Commercial quality with the use of frequency inversion or band-splitting.
M = Monochrome (Television).
N = Colour (Television).

The second letter defines the nature of the multiplexing.
N = None (Amateurs are not permitted any multiplexing of signals).

So we can see that by looking at the appropriate tables, it is to determine the type of emission specified. I will work through a couple of examples.

Example 1: 8K00A3E
Bandwidth = 8 kHz
A = Amplitude modulated main carrier with double sidebands
3 = Single channel containing analogue information
E = Telephony
Therefore 8K00A3E = AM Voice Transmission with Bandwidth of 8 kHz.

Example 2: 36K0F3E
Bandwidth = 36 kHz
F = Frequency Modulated Carrier
3 = Single channel containing analogue information
E = Telephony
Therefore 36K0F3E = FM Voice Transmission with Bandwidth of 36 kHz.

Example 3: 30M0F3FMN
Bandwidth = 30 MHz
F = Frequency Modulated Carrier
3 = Single channel containing analogue information
F = Television (Video)
M = Monochrome (B & W)
N = No multiplexing
Therefore 30M0F3FMN = FM Black and White Television Signal with no multiplexing and Bandwidth of 30 MHz.

TABLE 1 — BANDWIDTH OF EMISSION
200H = 200 Hz; 1K12 = 1.12 kHz; 2K00 = 2.00 kHz; 3K00 = 3.00 kHz; 4K00 = 4.00 kHz; 6K00 = 6.00 kHz; 8K00 = 8.00 kHz; 16K0 = 16.0 kHz; 36K0 = 36.0 kHz; 750K = 750 kHz; 6M25 = 6.25 MHz; 11M0 = 11.0 MHz; 30M0 = 30.0 MHz.

TABLE 2 — FIRST SYMBOL: Type of modulation of the main carrier.
N Emission of an unmodulated carrier.
A Amplitude modulated carrier — double sideband.
H Amplitude modulated carrier — single sideband full carrier.

R Amplitude modulated carrier — single sideband with reduced or variable level carrier.

J Amplitude modulated carrier — single sideband with suppressed carrier.

B Amplitude modulated carrier — independent sideband.

C Amplitude modulated carrier — vestigial sideband.

F Angle modulated carrier — frequency modulation.

G Angle modulated carrier — phase modulation.

P Series of pulses — no modulation.

K Series of pulses — modulation in amplitude.

L Series of pulses — modulation in width/duration.

M Series of pulses — modulated in position/phase.

TABLE 3 - SECOND SYMBOL: Type of signal modulating the main carrier.
0 No modulating signal.
1 A single channel containing quantised or digital information without the use of as modulating sub-carrier.
2 A single channel containing quantised or digital information with the use of a modulating sub-carrier.
3 A single channel containing analogue information.
8 Two or more channels containing analogue information.

TABLE 4 — THIRD SYMBOL: Type of information to be transmitted.
N No information transmitted.
A Telegraphy — for aural reception.
B Telegraphy — for automatic reception.
C Facsimile.
D Data transmission, telemetry, telecommand.
E Telephony.
F Television.
W Combination of the above.

TABLE 5 — LAST SUB-GROUP: Additional Information.
KN Sound of commercial quality with the use of frequency inversion or band-splitting — with no multiplexing.
MN Monochrome (Television) — with no multiplexing.
NN Colour (Television) — with no multiplexing.

NOTE: The lists above only include mainly information pertaining to the amateur radio service.

PUBLICATION OF COMPUTER PROGRAMS

Part of the technical editing of computer programs involves running the program. This has meant re-typing it from a listing supplied from the author. Many hours are spent by the editors entering the program, especially if, as does often occur, syntactical errors are introduced.

In future, to overcome this hold-up, alternative forms of program entry may be required, eg cassette, disk or via a modem. This will enable quick editing. If we do require the program in one of these alternative forms, we will provide the blank cassette, disc, etc or make the telephone call in the case of modems

Finally, a word of advice. Computer programs on their own do not make good articles. Please include with any program a description of your algorithm. Articles are much more interesting when they include, not just a description of the *how* but also the *why*.

STABLE VFO WITH DIGITAL READ-OUT

Morris Odell VK3DOC
84 Hill Road, North Balwyn, Vic. 3104

Morris has been very satisfied with his home-brewed VFO for a number of years and the February editorial inspired him to take the time to share it with the readers of Amateur Radio.

This design for a stable VFO is an old one, used by the writer for many years. It may not be as sophisticated as modern designs but it performs well and has been used for a long time at the head of a 18X multiplier for two metres with excellent long-term stability. The frequency readout is also old-fashioned by todays standards, but has the advantage, in my case, of being built from junk-box components and thus cost virtually nothing.

The construction of a good VFO is a demanding bit of home-brewing, requiring more care and attention to detail than most other projects. Of course, the satisfaction resulting from a successful project is a great reward and has to be experienced to be believed.

DESIGN CONSIDERATIONS

Any VFO must be constructed according to a few basic principles in order to get maximum performance in terms of frequency stability and spectral purity. The following are a few points that will be found useful:

** The frequency determining elements of the oscillator must be kept as free as possible from variation due to thermal factors. In practice, this means avoiding ferrite cores, plastic capacitors and varactor tuning. PCBs should be single-sided and of high quality. Tuning capacitors are definitely not the place to economise, they should be the best available and made of Invar if possible, with ceramic insulation. Such capacitors are not easy to find but are worth searching for. The advertisements in British and US magazines are worth searching as a starting point. Coil formers should be ceramic and silver plated coils and capacitors from disposals sources are often of excellent quality.*

** Mechanical rigidity is just as important. The VFO should be mounted in a sealed diecast box, preferably on a heavy chassis and with good quality dial drive mechanism. Again, these are not easy to find but are worth the search. Wiring of the tuned circuit should be in heavy copper wire, keeping lead lengths as short as possible and using ceramic stand-off insulators if required.*

** The VFO should be well away from heat producing gear such as transmitters. Some commercial designs even have it in a thermostatically controlled box, but unless you are rather obsessive, this is going a bit far (although surprisingly easy to do).*

** The power supply to the oscillator should be regulated and as stable as possible. The use of batteries is not as impractical as it sounds.*

** The oscillator should be operated at as low and stable a power level as possible to avoid thermal effects in the tuned network. The active device/s should load the tuned circuit as little as possible and should be isolated from it also to avoid unpredictable detuning effects. The loaded Q of the frequency determining network must be as high as possible. Low L/C ratios can help here.*

** The oscillator should be followed by one or more buffer stages in order to keep its operating conditions stable. These can be untuned but some form of bandpass characteristics is usually incorporated (in the later stages at least).*

** While digital frequency readout is an attractive feature, bear in mind that digital circuitry is a potent noise source. The readout logic should be in a well shielded enclosure and supplied with DC from a separate source. If the VFO is being used for a sensitive receiver, it should be possible to turn off the digital circuitry while searching for very weak signals. The signal for the frequency counter should be taken from a point in the buffer chain as far along as possible from the actual oscillator.*

THE VFO CIRCUIT

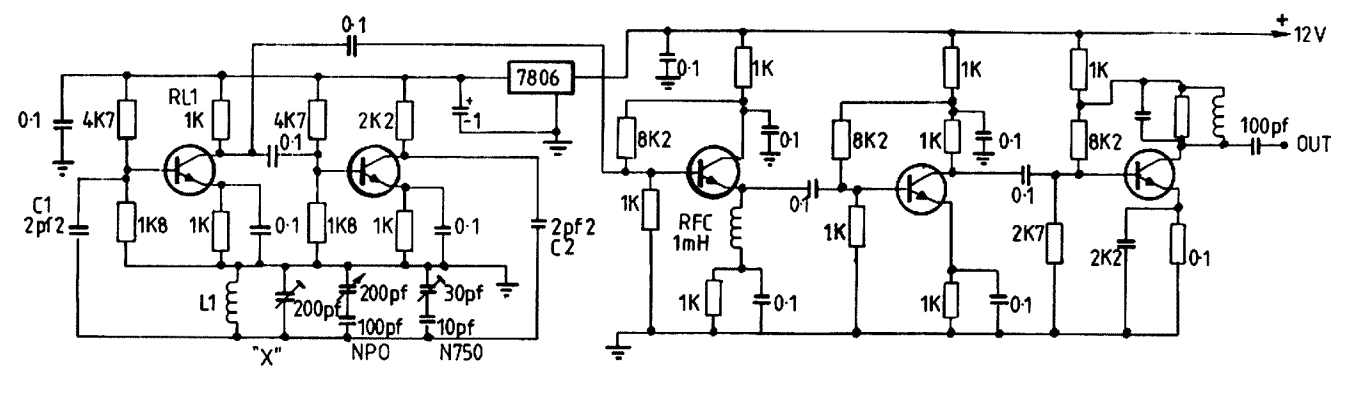
This VFO was built to cover the range 7.460 to 7.571MHz. I used a disposals *Command* transmitter as the chassis as the Command's tuning circuitry includes most of the features mentioned above. The tuned circuit is in a sealed box and is connected by a short piece of heavy gauge copper wire to the oscillator circuit in another sealed box. The iron dust slug in the original coil has been removed but the padding and trimming capacitors retained to adjust the tuning range. A small N750 ceramic capacitor has been included with an air-trimmer to couple it to the tuned circuit for fine adjustment of temperature drift. The VFO is battery operated and a couple of lantern size batteries last for over 100 hours.

The oscillator circuit I have used is the Franklin oscillator. This was quite popular in the days of valves as it is well suited to their input characteristics. I have found it to work well with bipolar transistors and have no reason to doubt its performance with FETs also. The circuit is basically a two stage amplifier with positive feedback arranged to include a loosely coupled tuned circuit. Although the circuit resembles a cross coupled astable, it will not work in this mode as the loop gain is too low. It is the Q of the tuning network that lifts the loop gain to the point of oscillation at the desired frequency only. In practice, the capacitors C1 and C2 should be of the same value and as low as possible consistent with sustained oscillation and reliable starting. I have found values of one or two pica-farad to be optimal and the amplifier gain can be adjusted by varying RL1 (not with a pot! I) to suit. Because of the low loading of the tuned circuit, point **X** is at high impedance and should be treated accordingly.

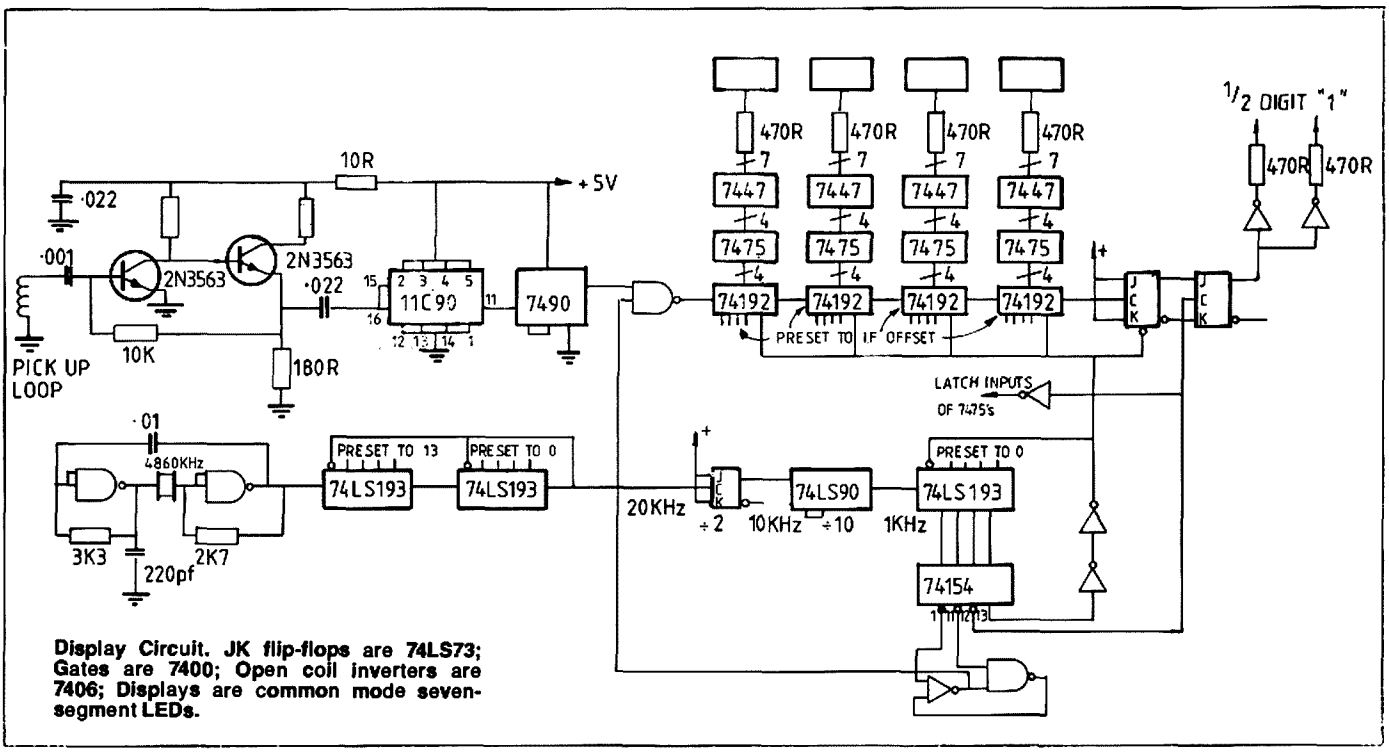
I have always tended to use low impedance practice with transistorised Franklin oscillators mainly in order to swamp any variation in device characteristics. It also reduces the likelihood of parasitic oscillations. Oscillator output is taken from the intermediate coupling point via an emitter (or source) follower and then through a two-stage buffer. This arrangement is open to change to suit a particular need. The tank for the final stage is a small air-wound coil in my VFO, but a ferrite toroid would also be suitable here.

THE FREQUENCY COUNTER

Because the VFO is used with a multiplier, there is no point in measuring its output frequency directly. Output was taken from the final multiplier via a small loop and preamplifier and then fed to a divide by 100 prescaler. The counter proper is a straight-forward design using TTL logic. The counter chain uses presettable counters in order to enter IF shifts for receive operation. The final *half-digit* is counted with a JK flip-flop, the other FF in the package serving as a latch. Count time is 10 milliseconds and the data is then latched into



VFO Circuit. All transistors are **2N3563.**



Display Circuit. JK flip-flops are 74LS73; Gates are 7400; Open coil inverters are 7406; Displays are common mode seven-segment LEDs.

the display. Timing is derived from a junk-box crystal on 4.860MHz, which is divided by 243 to give 20kHz and then by 20 to 1kHz for the control section. The display updates at about 70Hz and is therefore flicker free.

PERFORMANCE

The VFO has been checked against a properly warmed-up Hewlett Packard 524B counter and was found to vary less than 5Hz over 12 hours of continuous operation at 7.500MHz. The stability of my clock crystal in the frequency counter was not as good as this, although variation was not seen on the display because the short counting time gave only 100Hz resolution.

Harmonics were not able to be measured directly due to lack of suitable equipment, but were well down when tuned in on a communications receiver up to 30MHz.

This article is intended more as a guideline than a specific constructional project. Armed with the basics, construction of high quality home-brew VFOs is a lot of fun and very rewarding and I hope anyone attempting it will get as much enjoyment from it as I have.

REFERENCE: *Solid State Design for the Radio Amateur.* ARRL 1977.

AR

SEEING HALLEY'S COMET THE SECOND TIME

Further to the article *Halley's Comet - will we see it?* (p5 April AR), it was requested that if anyone reading the article and seeing the Comet for the second time, to please contact the writer. Four readers of AR did and their letters are reproduced in part.

The first was from Mrs C R Ferris and reads — *"I am the mother of VK3BUN and seeing your note in Amateur Radio re Halley's Comet prompted me to write.*

"I saw Halley's Comet in 1910 and twice this time, once when the tail was not visible in the north and this time when the tail is visible in the eastern sky.

"As far as I can remember in 1910, the tail was finer, more like a cats tail."

The second report was from Lindsay VK2EI, *"... I observed Halley's Comet in 1910, practically every day from the time it appeared until it disappeared.*

"I was in the country at the time and in those days there was no electric lights and no pollution, as cars at that time were a novelty, also I had better eyesight as I was 15 years of age. I am now 91, so you could say I am getting on in years.

"Halley's was certainly worth seeing in 1910, it kept getting bigger and brighter each morning before daylight, until it changed over to the night sky. It was then at its best with the head a few degrees above the horizon and the three tails, yes definitely three, reaching up to the zenith.

"I have seen the Comet this time with binoculars, and I must say that it is very disappointing. I have my camera ready hoping to get a picture of it.

"I also viewed quite a large Comet in either 1900 or 1901, but no one seems to know about it ..."

The third letter came from Frank VK3FC and reads *"... I have had a small telescope for years, given to me by the kids and on this return of the Comet, it has come in handy.*

"I found that the sighting did not work out quite as anticipated by the prediction. Before the last phases of the moon, in March, I could pick it up by ordinary eyesight and at a nice angle at 5 am. From about 6th of April and onwards it has got weaker and much harder to locate contrary to expectations.

"I have hazy recollections of seeing it in 1910 as a kid of seven years of age, the big awesome thing in the sky. This was at Clunes in Victoria. Of course, I am 82 years of age ..."

The fourth letter is from Ray VK3RJ. Ray comments: *"I had the loan of a fairly good pair of binoculars from 18th to 27th April, but due to a frustrating sequence of overcast night skies, I was afraid I was going to miss out. However, on 24th, the night sky was absolutely clear and enabled me to locate the constellation CORVUS* and the Comet. I also had a splendid view of the eclipse of the moon.

"The Comet sighting was not a patch as a spectacle, on the sightings (four) I had witnessed with the naked eye as a boy of 10 years of age, from Maryborough (Vic) in 1910. The Comet was then side-on and three times closer to the earth.

"So, I have joined the fortunate minority who have witnessed two orbits.

"I was born on 30th January 1900."

Thank you one and all for your contributions to my request and if someone reading this can assist Lindsay, it would be appreciated if they could contact him direct at his QTHR.

Contributed by Ken McLachlan VK3AH

NEWS FROM FRANCE

The Reseau des Emetteurs Francais, via F8BO, advises the following change of address for the French QSL Bureau.

Cards should be sent to *REF. QSL, BP 273, F-81209, Mazamet. Cedex.*

Call signs in France are TK; FG; FH; FK; FM; FO; FP; FR; FY and FT. Radio clubs are issued with FF prefixes.

Numerals are designated in licence class — 1 for Class A; 2 for Class B; 3 for Class C; 4 for Class D and 5 for Class E.

Class A licensees may use 144MHz phone and 20 watts; B may use 28.400-29.000MHz and 144MHz phone with 20 watts and 20 watts CW on 7.020-7.040, 14.050-14.100, 21.050-21.150, 28.000-28.100 and 144.050-144.090MHz.

Class C may use 144MHz and 100 watts whilst Class D may use 100 watts CW on all bands, all modes. Class E can use 250 watts, all bands, all modes.

BUT IS IT STEREO?

The Victorian Consumer Affairs Ministry has been concerned about the public buying radios and wrongly thinking they will receive AM-stereo broadcasts.

It has been found that many radios labelled *'AM/STEREO FM'* were bought on the assumption that both AM and FM stereo reception was available.

Consumers need to be very careful and make sure that they are getting what they want.

The Ministry has been negotiating with manufacturers and retailers to see if a much clearer way of labelling is possible. One suggestion was that radios able to receive both AM and FM stereo be labeled *"STEREO AM/FM"* and those receiving FM stereo only be marked *"AM WITH FM STEREO"*.

HOME-BREW EXTERNAL VFO FOR FT 707

Ray Dobson VK5DI
16 Howden Road, Fulham, SA. 5024

A slow response to a request for information about a ready made VFO and two recent articles in magazines prompted this writer to attempt to make his own.

A careful and detailed study of the relevant circuit diagrams of the FT707 revealed the "trade secret of the external VFO switching, namely, the unmarked switch near the *EXT VFO* socket on the FT707 connection diagram which is operated automatically when the *EXT VFO* plug is plugged in. *This switch cannot bo operated manually* — it is operated only when the *EXT VFO* is plugged in for use. Unplug the *EXT VFO* and the transceiver reverts to single (internal) VFO operation only. *(see Figure 5).*

A study of the circuit diagram of the FV-107 (external VFO for the FT-107) revealed how the *INT/EXT VFO, TX/RX, CLARIFIER,* etc switching was carried out.

The VFO (5.0 to 5.5 MHz) circuit used is shown if Figure 1 and is virtually a copy of the internal VFO of the FT707 — the only difference being the provision of the +8V for the switching via the *INT/EXT* switch to enable either the *EXT VFO,* or the *INT VFO* via a return to Pin 5 of the *EXT VFO* socket (this +8V is disconnected from Pin 5 when the "trade secret" switch operated).

The art work for the PCB, viewed from the component side, is shown actual size in Figure 2.

The component layout is shown in Figure 3. This layout and associated PCB is not critical and variations can be made to accommodate the different sizes and shapes of the components that come to hand.

The control circuitry is shown in Figure 4 and as stated above was adapted from the FV-107 circuit diagram.

The numerous capacitors of various types in the oscillator tuned circuit area may be questioned. However, although they are not absolutely necessary, they are there for some very good reasons, eg temperature compensation, frequency range, linearity, etc. The sum of these capacitors is variable from

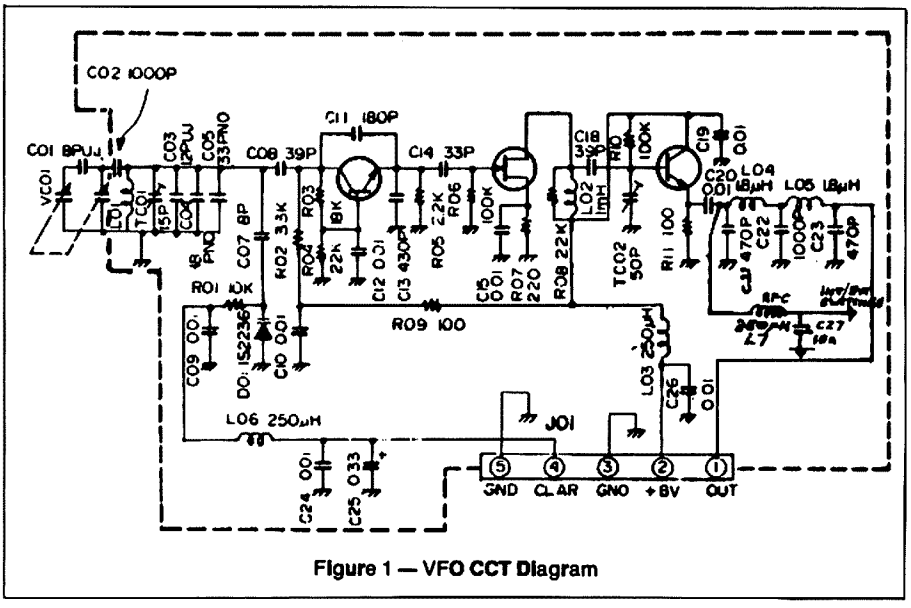
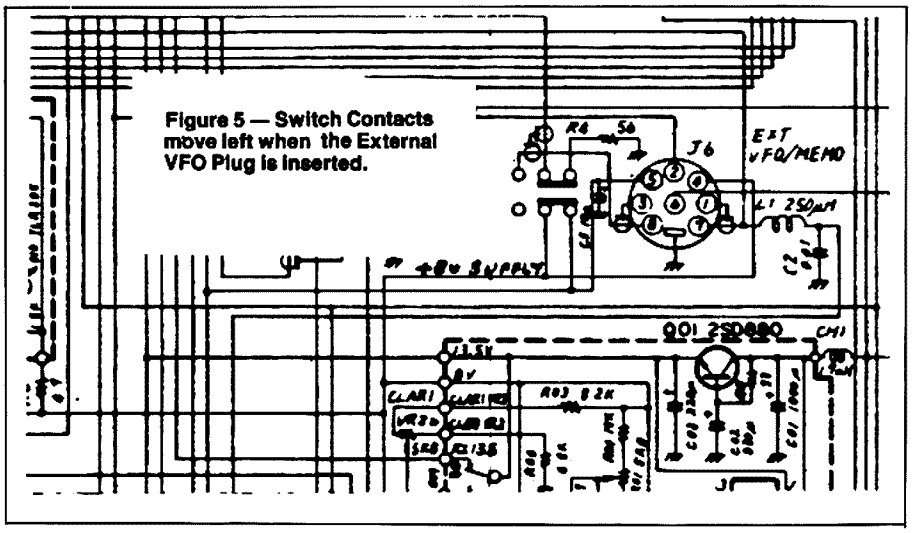


Figure 1 — VFO CCT Diagram



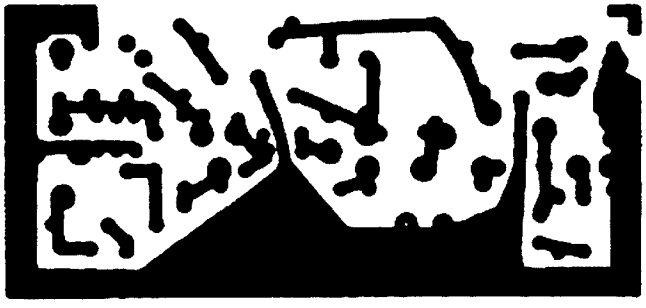


Figure 2 — Printed Circuit Board *viewed from the component side.*

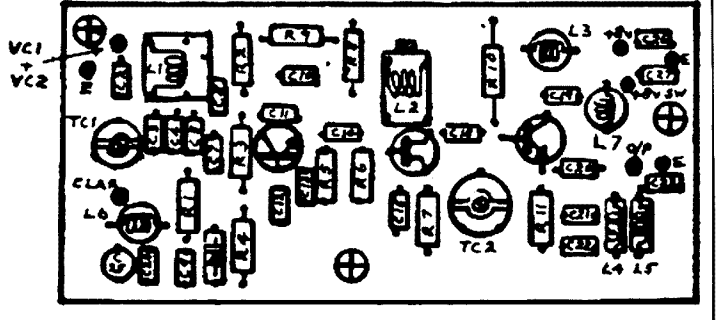


Figure 3 — Component Layout.

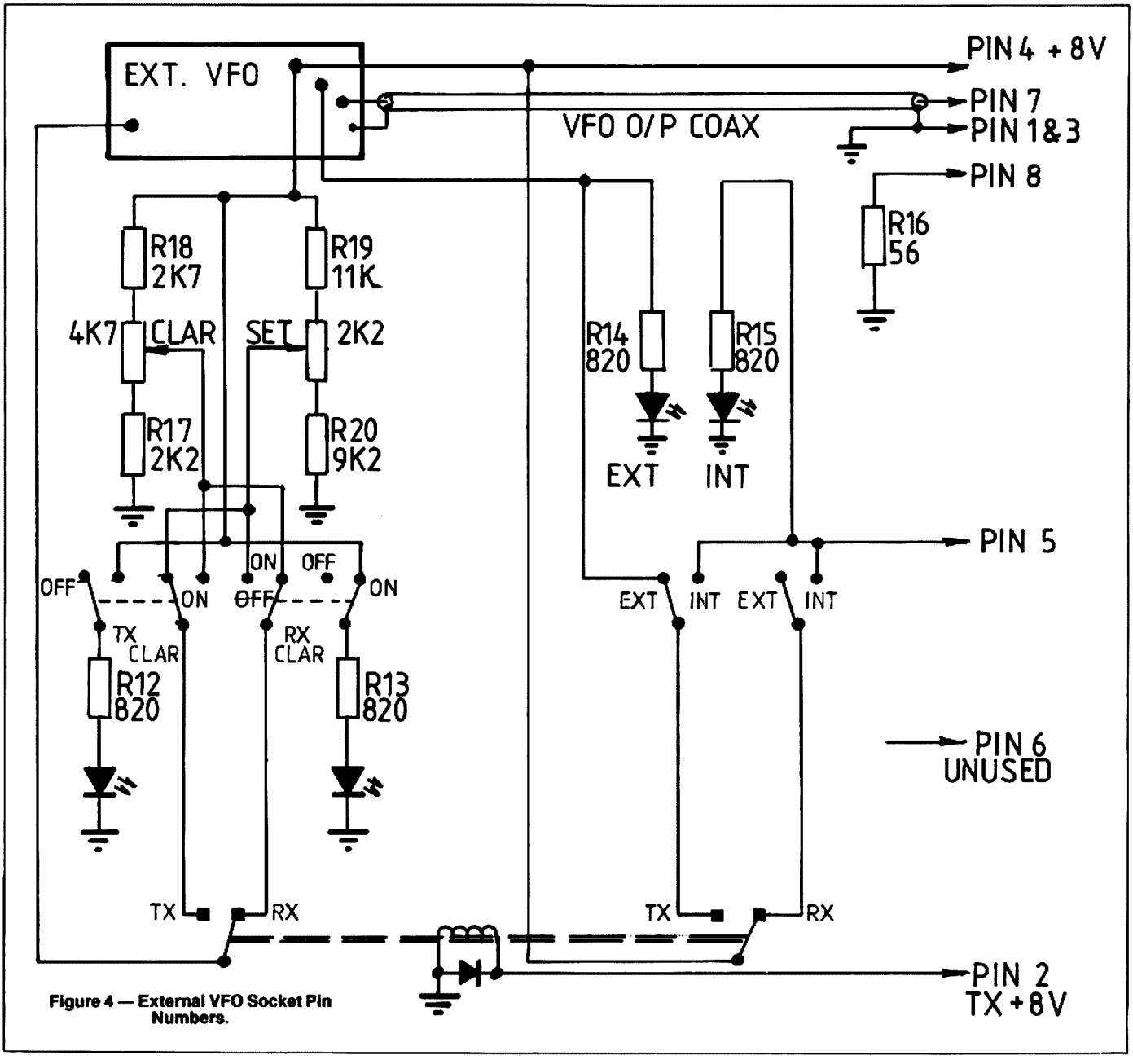


Figure 4 — External VFO Socket Pin Numbers.

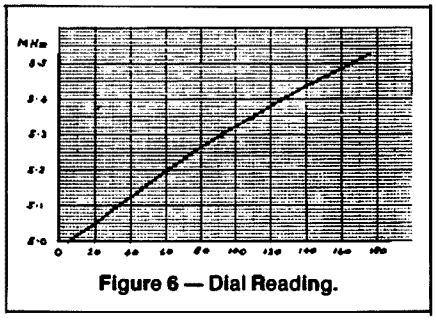


Figure 6 — Dial Reading.

about 85pF to 105pF and with the coil having a value of 9.5μH to 10.0μH, the circuit can be made to tune the range 5.000 MHz to 5.500 MHz. Figure 6 shows the plot of Frequency versus Dial Degrees of the prototype, and although it is not exactly linear, it is reasonably close. Due to the capacitor and coil variations the usual adjustment of the trimmer capacitor and the ferrite slug must be carried out to achieve the desired coverage.

The operation of the external and internal VFOs with the FT-707 circuitry is shown in Figure 7.

AR

PARTS LIST

Capacitors (pF)

1	8 C1*
1	8 C7*
1	12 C3*
1	18 C4*
2	33 C5*, 14
2	39 C8, 18
1	180 C11
1	430 C13
2	470 C21, 23
2	1n C2, 22
9	10n C9, 10, 12, 15, 19, 20, 24, 26, 27
1	.33μF (tant) C25
1	Varicap*
1	15pF trimmer TC1
1	50pF trimmer TC2
1	15 x 15pF tuning VC1 + VC2

Resistors (Ω)

1	56 R16
2	100 R9, 11
1	220 R7
4	820 R12, 13, 14, 15
3	2k2 R5, 8, 17*
1	2k7 R18*
1	3k3 R2
1	9k2 R20*
1	10k R1
1	11k R19*
1	18k R3
1	22k R4
2	100k R6, 10
1	2k2 pot*

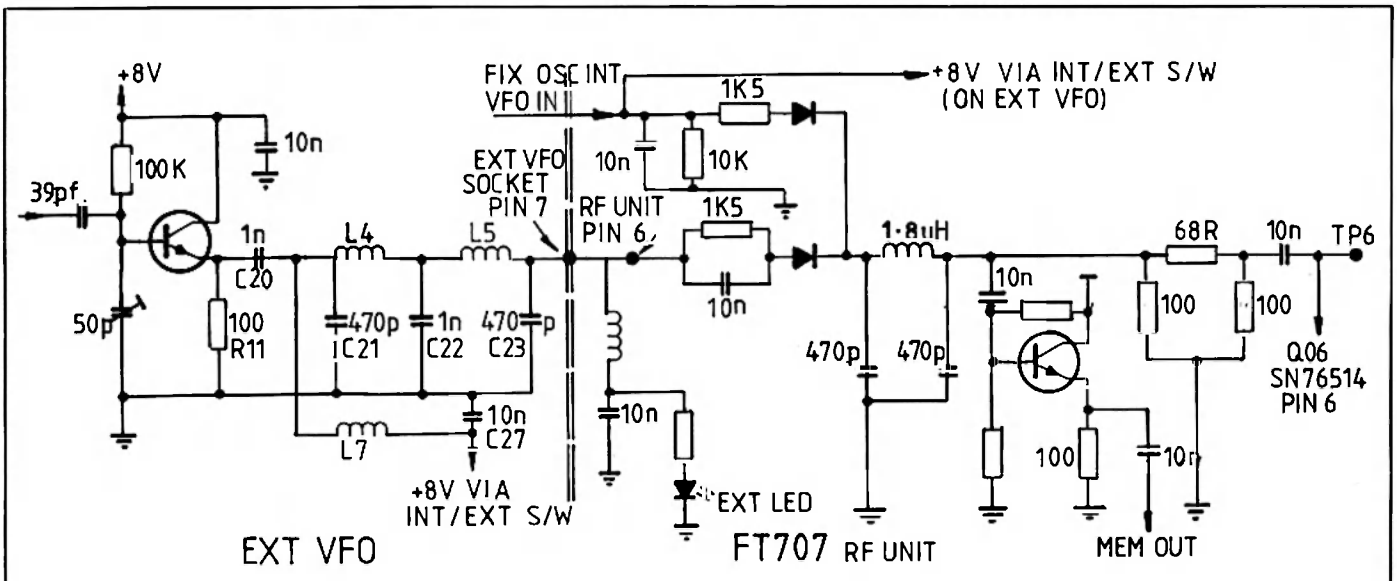


Figure 7.

*1 4k7 pot**

Semi-Conductors

1 2SK19GR (MPF 102, BC245, or similar FET)
2 2SC1815Y (BFX20, BC548, or similar NPN)
4 LEDs

Inductors

1 Osc Coil L1, 5mm ID x 25mm (36t 0.5mm wire)
2 RFC 1.8µH L4, L5
3 RFC 250µH (not critical < 390µH) L3, L6, L7
1 RFC 1mH L2

** — Value depends upon how much Clarifier action is required.*
 # — Temperature Coefficient chosen for frequency stability.

1 8-pin Yaesu Plug (for EXT VFO socket)
1 Metal Box (preferably cast-Aluminium
1 Relay (2-pole change-over)
2 Switch (1-pole change-over
2 Switch (2-pole change-over)
1 Slow-motion Dial
1 Knob for Clarifier control
Coaxial Cable, Cable, Wire, Tag Strips, etc.

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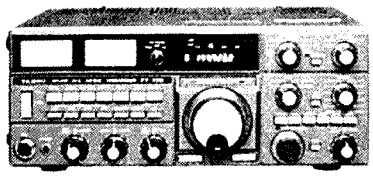
ANDREWS COMMUNICATIONS SYSTEMS

Why Pay Inflated Catalogue Prices?

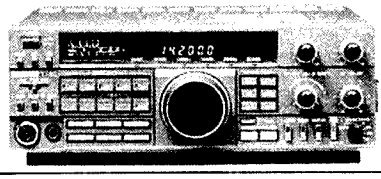
- YAESU FRG-965, 60-905 MHz ..... $799 ~~$849~~
- FT-209R w/FNB.4, chgr, etc $449
- FT-209RH w/FNB.4, chgr, etc $479
- FT-270(R)H, 45/5W 2m FM . $679 ~~$879~~
- FT-2700(R)H, 25W 70cm/2m $925 ~~$1095~~
- FRG-8800 comms receiver .... $879 ~~$929~~
- FC-757AT auto-tuner ..... $449 ~~$499~~



YAESU FT-726(R) . . . $1499

Includes 2m, mic, & 208Y Yagi. Why pay $1749?
SSB - CW - FM, 10W RF o/p, AC/DC (inc DC cable), most sensitive (0.15μV, SSB) transceiver. Optional 70cm $460 (inc 7011 GR*). 6m $360 (inc 604Y*), Sat $180.
*When bought with FT-726(R).
Full 12 months warranty on our Yaesu.

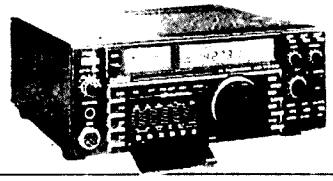
- KENWOOD PS.430 P/Supply $299
- WELZ SP-420 140-525 MHz, 4/20/200W, SWR meter $119
- CORONA/JUMBO HP.240DX, 200W RF o/P 3-30 MHz, adj rx amp, 4 pos o/P $279



KENWOOD TS-440S . . . $1550

Includes automatic tuner, mic. Why pay $1585?
HF transceiver w/99ch memory, 100W RF o/p, SSB-CW-AM-FM, 0.15-30 MHz rx, selectivity switch, notch, IF shift, NB, etc. NOW IN STOCK. Full 12 months warranty.

- ICOM IC-PS55 P/Supply $349
- IC-R7000 scanner due now $1499
- IC-390 UHF all-mode, 10W o/p $799
- IC-AT150 auto antenna tuner $599

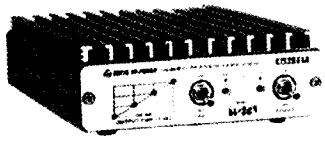


ICOM IC-731 . . . $1399

Includes 3el, 10m Yagi and mic. Why pay $1554?
HF transceiver w/12ch memory, 100W RF o/p, SSB-CW-AM-FM, 0.1-30 MHz rx, PBT, notch, etc. Full 12 months warranty.

- HL-60U 10-60W UHF GaAsFET rx $429
- HL-120U 10-100W UHF GaAsFET rx ... $699
- HL-66V 10-60W 6m, GaAsFET rx . $269
- HL-1KGX 1kW i/p, 160-10m (500W diss) $1250
- HL-2K 2kW i/p, 160-10m, 2 x 3-500Zs $2150
- HC-200 ant tuner, 3 pos sw, SWR, pwr .. $249
- HRA-2 2m GaAsFET masthead preamp $249

Factory direct importer of high quality THP



HL-35V

(HL-200E available on indent, not $499, our price $299)

TOKYO HY-POWER LINEARS

- HL-35V 3-30W 2m GaAsFET rx ... $179
- HL-62V 10-60W 2m GaAsFET rx .. $269
- HL-85V 10-85W 2m GaAsFET rx .. $379
- HL-110V 3/10-110W 2m MOSFET rx $479
- HL-160V25 25-160W 2m MOSFET rx ... $579
- HL-160V 3/10-160W 2m MOSFET rx $679
- HL-250 25-250W 2m GaAsFET rx coming

KENPRO ROTATORS — Directly imported

- *KR-400RC, 400kg/cm rotation torque .. $279
- *KR-600RC, 600kg/cm rotation torque .. $379
- KR-500 Elevation rotator 400kg/cm $279
- *Top & bottom mast clamps inc. Control cable $1/m

AOR AR-2002 . . . $729

Professional scanning receiver covers 25-550 & 800-1300 MHz in two continuous tuning ranges. Sensitivity 0.3μV NFM. Manual tuning knob, S-meter, 20ch memory, AC pack inc.
Why pay $799 RRP? 90 day warranty.

WHY PAY UP TO $79 FOR A 10/11m HALF-WAVE VERTICAL?

Our price for V27/Nation Blaster $29

- CHIRNSIDE CA-33 3el tribander . $349
- CHIRNSIDE CA-35DX 5el tribander ... $429
- CA-5 s/s 5-band vertical, 6m long $149
- CHIRNSIDE helicals, 80-10m monoband $36ea
- 10DFB by NIKKO, low loss coax ..... $5/m. SAVE!
- RG-213 $2/m. RG-8/U $1.50/m.

- 2m, 205Y, 5 el $49 • 2m, 208Y, 8 el $69
- 2m, 211Y, 11 el $89 • 2m, 208x8, 16 el $129
- 5R-208FD, 2m, 8 el, f/dipole, 3.6m boom $129
- 6m, 604Y, 4 el $79, 3.6m boom
- 10m, HD101103, heavy duty 3 el, 3.6m boom $69
- 10m, HD101104, h/d, 4 el, 5.4m boom $109
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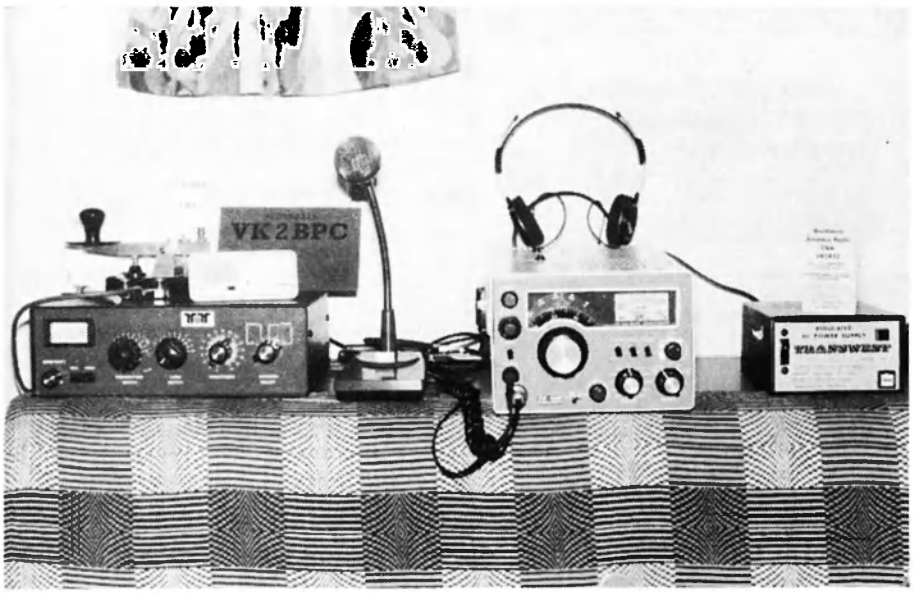
NORFOLK ISLAND — a DXer's Delight

Phil Connolly VK2BPC
PO Box 104, Toronto, NSW. 2283



The VK2BPC Portable QRP Station.

With the question in our minds as to where to go for our forth-coming annual holidays, the thought occurred to my wife and I that maybe some far-flung green fields might be interesting. After all, it was many years since any extensive holiday had been undertaken, and some exotic overseas port seemed to be calling!

After initial inquiries at the local tourist bureau, we quickly came to the realisation, that with the state of the Australian Dollar, it was almost prohibitive for the average family with three children to travel overseas and still live in peace with ones bank manager.

The alternatives didn't seem to have the same glamour about them until Norfolk Island came into the conversation. After all, it had been almost 15 years since we had been there and the children had never been. Another benefit was the fact that it was a domestic flight, which would make it cheaper for family travel. It was also my wife's homeland of childhood days so it would be interesting to catch up with all the relatives, friends and acquaintances, and see how things had changed since 1971. There was also one other thing (for me as a keen amateur) to help swing the vote in favour of Norfolk — the DX location!

So, the location has been decided, enter the next problem. How do you decide what to take on an aircraft in the form of radio equipment, when carrying luggage for five? Well, after much deliberation, it was finally decided that any fool could work the world with 100 watts plus and a VK9-prefix, so why not do it the hard way on QRP. With loving care the trusty little 10 watts, SS105S was packed, along with a 40 metre dipole, ATU, desk microphone, CW key, six amp power supply and sundry bits and pieces.

Just two and a half hours out of Sydney on a comfortable Fokker F28 jet, (A far cry from the five hour flight on the old DC4 Skymaster), we were preparing for touch-down onto the familiar volcanic soil once again, whilst attempting to show the children some landmarks we recognised.

Once through Customs we were met by Uncle-in-law, who whisked family and luggage away in an old Volvo, to our shack which would be home for the next four-weeks. Of course, (in true amateur spirit) upon entering the drive-way, I couldn't help surveying the local flora in an effort to gauge the height of the Norfolk Island Pines surrounding the house. One *little beauty* just outside the shack window that rose to about a height of about 25 metres could most surely be the hanger for the 40 metre dipole — but that would have to wait until we had been to the local shop to stock up the larder: even amateurs have to eat!

There had been some speculation from amateur friends back at my home QTH as to how long it would take for me to get on air. Well, on arriving back from the shop it was straight to the most important business and up the tree, to hang the centre of the dipole at about 18 metres and form it into an inverted vee. (If you like climbing trees I can certainly recommend the Norfolk Pine! It seems to have been designed specifically with amateurs in mind, as its branches are spaced just right for climbing, and it is very sturdy, into the bargain, which allows little or no swaying in the breeze).

Once inside the shack again with the gear ready to switch on, I thought I would try 15 metres as it was about the right time of day. Upon tuning around the band, the familiar sound of JAs seemed to be present so I decided to call one and test the effectiveness of the equipment. What I was about to experience will *always* be remembered! A VK2 call sign is not exactly a most sought after DX call and momentarily I had forgotten the significance of my location. After having successfully worked a couple of JAs, and within a very short period of time, it seemed as if half of Japan was trying to work me, all at once. I was suddenly on the receiving end of a *pile-up*. All

Les VK9NI and his wife Jean.

John VK9JA and his wife Florence.

was working well and reports on 15 metres were 5x3 to 5x7 — not too bad for low power, but a quick burst on 40 metres soon confirmed that I might make a contact back home on my first night — which did happen.

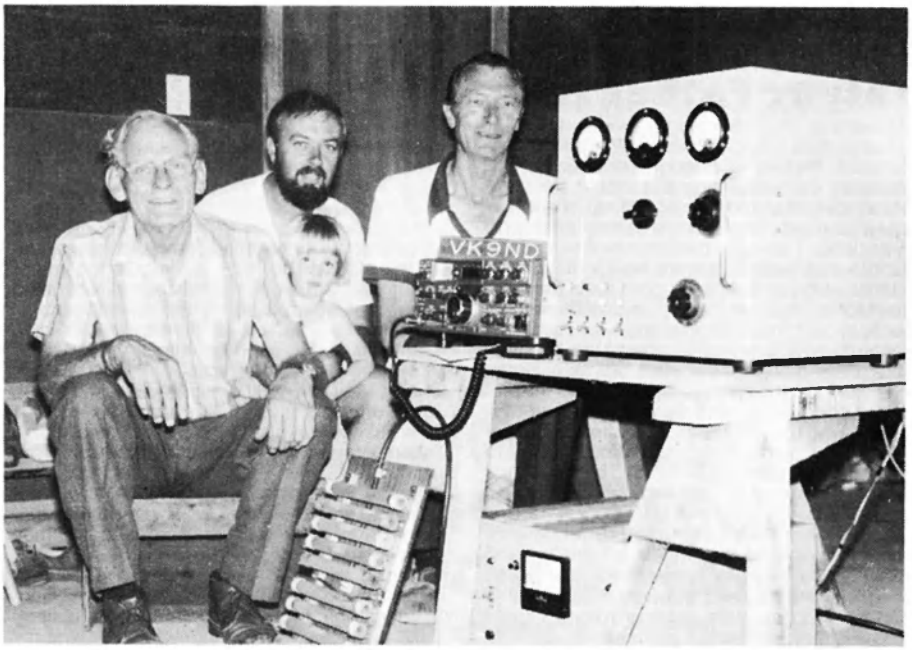
Of course, the trip was not all amateur as the family had to be considered too, so the DX work was confined mainly to the evenings when we were not going visiting, etc. As well as our own luggage, we were persuaded to take about 10 kg of QSL cards by the VK2 QSL Bureau, and one of the more interesting parts of the trip was meeting the recipients of these cards. Memories will long remain of the time spent with Bob VK9ND, Les VK9NI, John VK9JA, John VK9NJ, and all their wives. VK9NJ may be better known as VK2ANO, as John and his wife had decided to spend a holiday there at the same time as we had.

The shack of Bob VK9ND, was very popular with the DX-chasers, particularly when he and John VK9NJ were working two different bands — Bob on a TS520S and 20 metres, whilst John was on a TS830S and linear on 40 metres, downstairs in the garage. The linear was a home-brew variety, made by Bob, a most professional looking piece of equipment and a real credit to its creator.

The time spent with Les VK9NI and his wife Jean was very pleasant in their beautiful garden surroundings, and it was nice catching up with the people who had previously only been voices at the other end of a QSO.

If you think these people have it made living in a little 15 square mile Pacific DX Paradise, you are right! It certainly is a nice place to live.

Another face to visit was John VK9JA, the call sign of the longest standing amateur on the Island, and a longtime friend of my wife's family.



From left: Bob VK9ND, Phil VK2BPC with third harmonic, and John VK9NJ. Bob's new home-brew linear and power supply feature in the centre of the photograph, with the dummy load at the bottom centre.

me as the Westlakes Amateur Radio Club, of which I am a member, was the first amateur radio club to become involved in an application for a community radio station licence.

Well, could I recommend a holiday on the magnificent island to a DX chaser? The answer is most definitely yes as not only will you have a great time on-air, but you will also meet a lot of interesting and friendly people and be able to catch up on a lot of Australian and Norfolk history. You may even find an odd bargain with the duty-free shopping!

With the holiday finished, a quick tally of the log indicated that 31 countries were worked, which was not bad for low power, dipole and spasmodic operation on 40 and 15 metres during a propagation low. Probably the /VK9N had something to do with it!

Of just as much interest as the DX to me though were the regular scheds to my many amateur friends back home who were enduring the hot Australian summer across the water.

ar

This Ionospheric Receiving Station is one in the Australian Network and is located on Norfolk Island.

John admits to not being very active these days, but he can be heard each day at 2100 UTC, 14.315 MHz, on the Maritime Mobile Net, giving much appreciated weather details to the many yachtsmen who call in. John's time is mostly taken up with his two electronics shops, and showing films on the history of Norfolk and Pitcairn to the tourists, not to mention his activity with the Norfolk wildlife conservation program.

Being the VK2 QSL Bureau Manager gave me cause to discuss the problems faced by our VK9 friends with the constant flow of cards that make their way to them. We have to realise that these people are in a very sought-after DX location, (as I experienced, first nand), and to expect a return card to a VK2 or VK3 etc, via the bureau, without making arrangements during the QSO is asking a lot of them. Where as we have a hundred, or possibly two hundred cards pass through the system, the VK9s could count them in thousands, so it becomes a very expensive business for them. If you are after a card, why not use the general rule of rare DX locations and pop an IRC in with your card. I can assure you of a good return service. As can be appreciated, few, if any, VK9s really need a mainland VK card, but almost all are prepared to QSL with a little help.

Unfortunately, Jim and Kirsty, VK9NS and VK9NL, were away in New Guinea at the time of our holiday so we were not able to meet this time — hopefully next time!

With so many places to see and so many people to meet, it certainly didn't take long for the four weeks to pass, but I did manage to visit the local radio station. Broadcasting takes place from a small studio, not far from the main shopping area and goes to air on 93.900 MHz FM and 1.566 MHz AM (although the AM broadcast was temporarily suspended whilst a new AM stereo transmitter was being installed). This was of great interest to

The VL2NI Broadcast Studio with Kathy Lecren at the Controls.

QSP

ONLY NATIONAL UHF NETWORK

On 16th March 1986, SBS-TV became the Australia's first national UHF television network, which opened a new chapter of broadcasting in this country.

The date marked the network's expansion to Perth and Hobart, via AUSSAT, making SBS-TV accessible in all capital cities except Darwin. The signal will be transmitted across the metropolitan area in both cities on UHF, from a transmitter atop Mount Wellington in Hobart, and Mount Bickley in Perth. All programs will originate from Sydney.

It also launched a new line-up of programs including award-winning international films, excellent series and major new local productions.

Viewers in all areas have access to the network's Sydney studios via a national toll-free telephone number (008) 22 6322, costing only a local call fee.

AMATEUR RADIO IS CONTAGIOUS

A tribute to an Amateur Father from an Amateur Son

Rodney Gow VK2END
PO Box 105, Castle Hill, NSW, 2154

Some may think amateur radio a strange hobby for a grown man, as it must surely be easier to talk to friends over the telephone instead of twiddling all those knobs and things, but there must be something to it as son follows father into the hobby.

I guess I first became interested in amateur radio about six years ago. Whilst visiting my father, George Humphrey VK2NO, one winter afternoon, he asked me to climb onto the roof of the house and snip a quarter of an inch off each end of a piece of wire, called of all things a *Dipole*. He explained that this would eventually reduce his *SWR* down to *One to One* on the meter in *The Shack*. It seemed like a simple job and, although a stiff August westerly wind was blowing, it would only take a minute or two to finish.

During the next half-hour, alone in the wind on the roof, interrupted only by Dad calling out *"Cut another quarter of an inch off each end of the antenna, mate, it's still a bit high"* — I got to wondering *"what the devil is a Dipole, an SWR, what is the complicated mathematical equation of One to One, and why does he insist on calling the third bedroom The Shack."* I recalled thinking some 30 years ago, as a teenager during one of Dad's *on-air* sessions, that amateur radio was a strange hobby for a grown man and why didn't he just speak to his friends over the telephone instead of fiddling around with all that equipment and twisting all those knobs. This line of thought was interrupted by Dad calling out, *"Come on down, mate, it's one-to-one."*

So, when I descended from the roof (after clipping little bits of copper wire from a thing that looked like an old fashioned clothes-line), I entered the third bedroom — sorry, the shack — where, I might add, it was warm and without a trace of the cold wind which had been my companion on the roof. I asked Dad to explain to me what enjoyment amateur radio gave him and why hadn't he become bored with a hobby that he had been active in since 1928.

Over the next hour, or so, I very slowly began to understand a little of the enjoyment he derived from his hobby and the meaning of words like Dipole, SWR, and One to One — the spark of interest was ignited. As the days went by other terms were explained like Wave Lengths, Ground Plane, Yagi, Capacitor, Diode, QSO, QSL, DX, CW, RTTY, AM, FM and Sideband.

I sat in the shack and listened with a new interest to Dad talk to friends he had had for over 50-years and to those new friends that had only just gained their licence. When Dad's mates called in for a visit I joined them and listened when they were second operators talking to distant friends in a Net — and my interest was becoming very keen.

During one of his QSOs, Dad said, *"I'll hand you over to my second operator."* I had a quick look around the shack, there was only Dad and I there — Gee, I'd love to have a talk, I thought! When I positioned myself in front of the microphone I discovered another new phrase — *Mic Fright*. My mouth became as dry as the Simpson Desert at drought time, with the words at first stumbling out at a very slow, unconfident rate and then speeding up to a rate that a race caller would have had trouble trying to decipher. I am sure the other amateur would not have understood a word I said. But when I handed it back to him, it gave Dad the time needed to settle me down and give me the confidence I needed and after a couple of overs the whole session became most enjoyable, even though it did start out as a *Nerve Wrecker*.

My very next contact was with a brand-new Novice who had only been on-air for a couple of days and I asked him how difficult it was to pass the examinations — *"Easy"* he said, *"Just a bit of study and your in like Flynn"* — (not all amateurs tell the truth ALL the time).

Based on this *Just a Bit of Study* philosophy, I sent away for the appropriate information and study guides. A week later back came the paper-work. I browsed through it and said to Dad — *"You must be kidding! Nobody could study all that information and pass an exam in less than 10-years! I"* But, in his own special way, he convinced me to *Have a go* at the easy part first and if I could learn the Regulations and five words-per-minute Morse send and receive, then we could worry about the theory-side of things a bit later. I took some convincing but eventually agreed with Dad, as the Regulations were not all that hard as they were really based on common sense, and as Dad had already put in several hours of explanation, I felt I should at least try.

We put all the information we couid onto a cassette and whenever driving I continually played it on the car cassette over the next couple of weeks. It slowly sank into my memory, so, back to Dad I went to ask him to test me. To my surprise I had remembered most of the answers!

The spark of interest started to grow into a little flame. *"What's next?"* I asked. *"Easy"* Dad replied *"Have a crack at the Morse, all you have to remember is the symbols for 26 letters and 10 numbers — that's only 36 things all told and that is a lot less than the Regulations."* It crossed my mind that the Novice that had told me *"Just a bit of study and your in like Flynn"* would have summed up the learning of the Morse code in the same simplified way, but no, I must be wrong, it sounded easy enough. *"Okay Dad, I'll go home and learn them all tonight!"*

After a couple of hours study I went to bed and at breakfast next morning, lo and behold, some of the symbols had lodged themselves in my brain! Dit = E and Dah = T — only 34 to go. This was harder than a second language and I now thought the *in like Flynn* man was definitely working in collusion with Dad!

A couple of weeks later, when I did know all the symbols, Dad tuned in the WIA Slow Morse Session on 80 metres, saying it would help me. He then lent me his old Swan 350 and we set up a listening station at my home. For weeks on end I tuned into every Morse session that the WIA put to air.

It was about this time that both my wife and my mother thought that Dad and I had taken leave of our senses as we talked to each other in Morse and the Q-code.

I bought a cheap key and we built a buzzer into a cigar box and began sending and receiving sessions. We also made tapes to listen to on the car cassette. I told Dad of one occasion of sitting at the traffic lights listening to the symbols and saying out loud the appropriate letter when I noticed a passenger in the car next to mine looking at me rather strangely. I was a bit embarrassed, then thought it may be better, during this kind of practice, to keep the windows closed in case someone overhearing be might think it their duty to throw a net over me!

I passed the Regulations and send and receive Morse examinations and six months later managed to pass the Novice theory. The letter came in the morning mail advising me that at last I was a Novice! I rushed into town and picked up my call sign, VK2PVG (I was not going to wait around in case they found that they had made a mistake or, who knows, they may even run out of call signs!).

Armed with the receipt and my call sign it was home to collect my wife and off to tell Dad. I thought that I was happy but he was jubilant. That night I went on-air in my own rite and my first QSO was with Dad. We were like a couple of kids — full of excitement. Boy, that first QSO with your own call sign is something you can never forget.

I had also managed to pass the 10 WPM Morse exam on the day I had passed the Novice theory so all that remained was the AOCP theory examination, and on reading the various theory books, it looked like *The Impossible Dream*. However, Dad reminded me of what the Novice had told me over a year ago and the study began again. With only a meager two or three hours study every day for only a year I managed to gain the AOCP with a new call *VK2END*. I was very happy and relieved, but Dad was even more jubilant than when I had gained Novice status. Again, my first QSO with my new call was with Dad. The next day we sat around and Dad talked of the *Old Days* when he had been an operator, as part of the Waverley Radio Club, of the Mosman Experimental Wireless Station VK2NE (Nelson Eddy) and of how he and his old mate Hughie (now VK2ZAM), would broadcast records and birthday calls on the frequency of radio station 2SM, when the commercial station closed at midnight on Saturday nights, until the early hours of Sunday morning. The first broadcast was in September 1934, all carried out on mostly home-brew equipment, and was broadcast not only to local listeners, but to the DX Club of New Zealand who arranged to listen to the broadcast. This was the first time an experimental station in Australia had ever attempted a broadcast of this nature. He talked of working as an operator in the theatre and of his job with Western Electric wiring theatres, like the Lyceum, in the city and many suburban and country theatres, for sound when *Talkies* were introduced. Of how, after the war, he changed his call sign to VK2AKM (Australian Kilo Watt — Dad's own phonetics) and how he changed this to VK2NO (Nancy Ocean) to honour his old friend Don Nott, the original holder of the call sign, whom Dad had known since Don had arrived in Australia as a ship's operator. Don had passed away and Dad thought that it would be a good way *to keep the flag flying for Don*. Many new contacts would tell Dad about Don, and Dad would always tell them something extra that he would recall, and in this way Dad honoured the memory of his old mate.

In 1973, as reported in the press, during a QSO between Dad and a close friend, Horrie

Oaks VK2FA a breaker, who had hastily set-up his rig at the Riverina Advanced College of Education, asked if he could introduce a *special visitor.* The visitor happened to be HRH Prince Philip, The Duke of Edinburgh, who was visiting the college to present awards, and as his interest in radio is well-known, an amateur station was set-up for him. Dad recalled, *"We had quite a chat with the Duke, he was very keen on the history of amateur radio in Australia and passed on his good wishes through Horrie and myself to operators in this country."*

On another occasion, also reported in the press, during a Telecom industrial dispute, the Royal Hobart Hospital was unable to contact the Medical Application Centre, in Gladesville, Sydney, for spare parts for a Gamma camera used in the Nuclear Medical Department. A faulty relay switch made the unit unserviceable and as a result of the dispute telegrams and a telex did not arrive. A strong signal from VK2NO was heard by Mr Allen O'Halloran, the Head Technician of the Hospital, who was also an amateur, VK7OH. After permission to help from the various authorities was granted, a section of the 20 metre band was kept open by other amateurs until contact was made with the centre at Gladesville and the spare part was sent, post haste, via Mascot, and in a short time the Gamma camera was back in operation.

About this time I went, as Dad put it, *Key Crazy* and a very large percentage of my QSOs were on CW and as Dad was a *Phone Man* I asked him why he didn't use CW. *"Son, the first licence I held was restricted to working CW only for six or 12 months and, at the end of that time, after the PMG's Department sighted my log, I was allowed to use phone. That afternoon I borrowed a row boat from a fisherman friend at Mosman Bay and rowed out into the middle of the harbour and dropped the Morse Key to the bottom where it belonged — but if ever I do decide to take up brass pounding again, and need a key in a hurry, I know exactly where I put it! I"*

During last year, Dad introduced me to two metres and we enjoyed many QSOs while I was mobile at work and I met many of his mates who were restricted to these particular frequencies. It is a whole different style of amateur radio, but just as enjoyable.

On 18th March 1986, my Dad, George Humphrey VK2NO, went *Silent Key*, I know I will surely miss him and I know his friends will too. I hope to keep Dad's call sign active and *Keep the Flag Flying* in honour of both Dad and Don.

ar

MOBILE MOUNTING BRACKET FOR A HAND-HELD TRANSCEIVER IN A VEHICLE

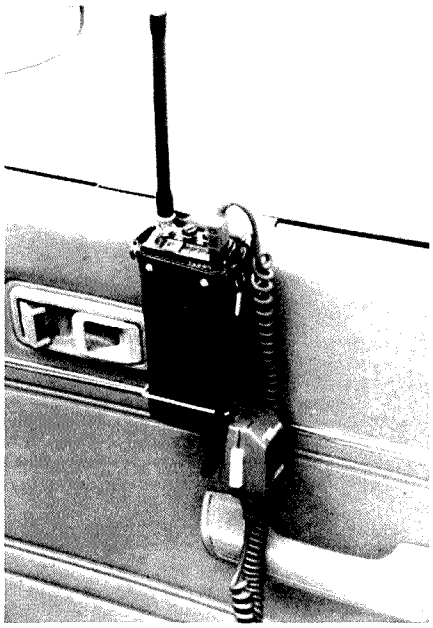
Steve Mahony VK5AIM
19 Kentish Road, Elizabeth Downs, SA. 5113

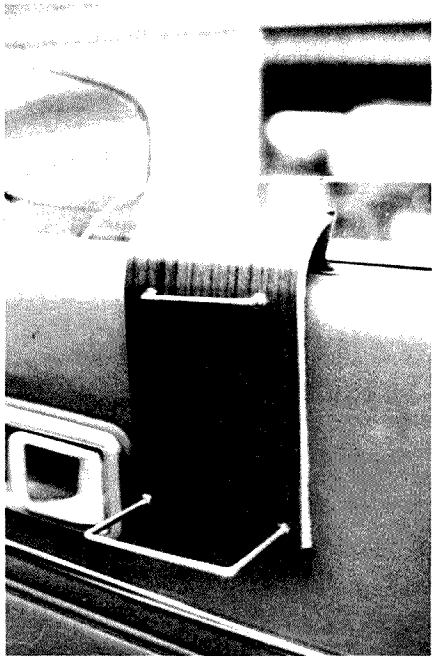
Having purchased a two-metre FM hand-held transceiver, and used it in the car I decided some form of Mounting Bracket was required. An inspection of an electronics brochure showed such a bracket was available. Further investigation at the local electronics store revealed a plastic variety which was deemed to cost more than it was worth.

A little thinking and a few practice cuts and bends with a piece of cardboard from a cereal packet, soon indicated the necessary shape.

The final bracket was made from a piece of brown covered Marviplate which matched the vehicle trim admirably.

The strip of metal is 220 mm long by 78 mm wide (or cut to suit a particular unit's dimensions). It is necessary for the curve of the top hook to match the internal contours of the car door — see photographs.





The bracket slips down between the window. The top bar accommodates the belt-clip of the hand-held whilst the bottom one steadies the unit.

Line the back of the metal with a piece of thin foam plastic to protect the door panel. The top bar is made of ⅛ inch (3 mm) diameter brazing rod, threaded with a ⅛ inch (3 mm) Whitworth thread, to secure the nuts for holding the rod in place. The width of this bar is adapted to suit the belt-clip of the hand-held.

The lower support bar is also ⅛ inch brazing rod prepared in a similar manner to the above one. This bar is made to fit the hand-held. It only stops the unit from moving around and the microphone can hang on it when not in use.

Around the city and suburbs the rubber-duckie antenna is quite satisfactory to access the local repeater, but if your location is a bit noisy, a quarter-wave Gutter Grip antenna or a small length of coaxial cable should improve signals.

A word of warning ... Do not leave your vehicle in a public car park unlocked or with the window wound down or you will not have a hand-held ... and the local repeater may have an extra user! Unclip the unit and take it with you. I am delighted with my hand-held and take it everywhere with me.

Whilst we may not be able to home-brew equipment equal to the latest piece of professional amateur technology, there are many little pieces of ancillary gear and accessories that the amateur can build and have the satisfaction of saying that "I made that myself!"

ar

QSP

SINGLE CHIP MODEM

The first single chip modem for 1200 bps full-duplex transmission has been introduced by the Linear Division of Fairchild.

The μA212A modem performs all signal processing functions required for a Bell 212A/103 compatible modem. It incorporates an on-chip switched capacitor modulator, digital coherent demodulator, switched capacitor filters, 3.6864 MHz crystal oscillator and certain control and self-test functions.

To form a complete system, the unit requires only a general-purpose single-chip microcomputer to handle dialing, handshaking protocols and mode control functions and minimal external circuitry to handle the RS232C interface, ring detection, telephone- line interface and power supplies.

For voice/data terminals, where high reliability and space savings are critical, the μA212A provides the first single- chip upgrade path from one-chip 103-type 300 bps modems.

It is capable of accommodating both high and low-speed data rates, and incorporates a novel switched capacitor modulator and digital coherent demodulator for 1200 bps QPSK operation, and a separate digital FSK modulator and demodulator for rates of 0- 300 bps.

For example, in the high-speed asynchronous mode, transmit data from the DTE enters the chip's transmit buffer which synchronises the data to the internal 1200 bps clock, in the synchronous mode the buffer is disabled.

From Australian Electronics News, March 1984

"When Morsing, Remember the Human Factor"

Written by Jack Hum G5UM and reprinted from The Shortwave Magazine, February 1986

Smarting somewhat from the sensation produced at a previous meeting — quite unwittingly — by that quiet American, Cyrus B Clickmeister, about how telegraphy was used Stateside, the club members assembled in critical mood for "The Annual Inquest".

Not at all as cadaverous as it sounded from its title, "The Annual Inquest" was the meeting of the year when the Club looked back on its performance in The Great Annual Transmitting Contest, decided what went wrong (if anything), what went right (If anything) and How to do Better Next Time.

Mister Chairperson set the temper of the meeting when, recalling That Contest, he said that although the weather was good, the food was good, the logging was good, and the equipment good (for most operators, even if some felt there were too many confusing bells and whistles on the front panel), there was one area which was *not* good: "Our telegraphy performance was lamentable, and I'd like to ask what you all think can be done about it well ahead of next time."

To the surprise of all, The Man at the Club spoke up at once to say quite forthrightly: "What can be done about it? Why, refrain from entering at all next yeart Telegraphy is an outmoded form of communication anyway."

Coming from one known to have served twenty years as a seagoing operator this observation was received with what is sometimes called a stunned silence. Then, from an atomic cloud of tobacco smoke at the rear of the room emerged the quiet bass voice of Highly Technical Gent:

"With respect, TMC, I think that remark of yours to be defeatist, to say the least . . . and I speak quite dispassionately as a Class-B ancient of two decades' sitting who hasn't the slightest interest in your dit-dahs."

The stunned silence was broken again, this time by Virginibus:

"I wonder what Cyrus B Clickmeister would have to say about that!" he piped: "Pity he's had to move on to Gotterdammerund or was it Garmisch-Partenkirchen?"

"Garnish *what?*" roared Ethelbald: "That's what they do down at the Chinese takeaway."

"H'm, we *are* getting international!" murmured Old Fangler ". . . what with Germany, China and our dear American friend."

Detecting that the discussion was wavering woefully away from the specified bandwidth Mister Chairperson attempted to pull it back on frequency:

"International . . . a buzzword it ever there was one. And 'Morse': another buzzword if I may say so."

Nobody could decide if this reference to Morse was an intentional pun or an unintentional one. At any rate, everybody was too polite to laugh. Then —

"Please speak, Old Fangler" invited Mister Chairperson: "*You've* been pounding brass and diddling bug-keys longer than most of us. Do *you* feel we fell down during The Great Transmitting Contest because we weren't good telegraphists?"

Never one to be cornered, Old Fangler gave it as his opinion that some of the Club members were good telegraphists for some of the time but not all of them for all of the time. He felt he ought politely to dispute TMC's suggestion that telegraphy was an outmoded mode. Wanning to his theme as he so often did when roused he went on:

"Remember with CW you are putting all of your transmitted power into a single note in the distant listener's receiver. You don't do this with even the best generated SSB. Your voice spreads out that note from cycles wide to kilocycles, and from what I've heard a lot of it splatters far beyond the 3½ kilocycles it ought to occupy."

"He means hertzes not cycles" came an anonymous comment from somewhere in the middle of the room. Ignoring it Old Fangler went on:

"If you think about it you won't deny that telegraphy is the most efficient means of sending information that you could want — and I think Cyrus B demonstrated this to us at the last meeting."

Rarely did O-F expatiate at this length. "He's proper wound up" was Ethelbald's stentorian opinion. Then through a Battle of Jutland smoke screen at the rear of the room came the thunder of a heavy cannonade: it was Highly Technical Gent to say:

"You can't substantiate that claim, Old Fangler. With respect to your many years and to your dear old bald pate I would suggest that any form of data-processed transmission gives you a higher efficiency in terms of information impartation than your old up-down brass pounding ever could."

Impartation . . . I must remember that one" murmured Mister Chairperson to Mister Moneybags in the next seat: "You don't think he meant im*plant*tation" came the whispered reply.

Young Virginibus of the sharp ears, overhearing these sotto voce exchanges quickly chipped in:

"All this data processing stuff is a bit off-beat. Let's get back to real Morse. What I've noticed is that lots and lots of people are very, very keen to use it. And six thousand of them are those Class-B people who asked for that variation in their licenses to be made to let them get pounding!"

With a snort that could have been congestion of his tobacco pipe but probably wasn't, Highly Technical Gent gave it as his opinion that the noble six thousand had requested the Morse facility solely to speed the day when they could get away from those boring omni-directional QSOs on 'Two' and instead talk to the world on aitch-eff phone. "If you believe they want to mug up the Morse to talk to each other on 'Two' you'll believe anything, young Virginibus", he declared.

"Spread a little chanty, HTG" requested Mister Chairperson: "It's just possible that the six thousand and lots of others like them do genuinely believe CW to be the best mode there is, and that's why they're mugging it up. I'm confident they'll continue to use it even when they've graduated to Class-A and aitch-eff."

"Hey, they don't graduate!" snapped HTG: "May I remind you what I've said here before, that a Class-B system is demonstrably more efficient than a Class-A one?"

A groundswell of assent and dissent rose from the assembled members like the sussuration of a charged cloud when the antenna is turned upon it. Mister Chairperson felt it was time to effect a *dis*charge.

"Thanks, all, for your opinions" he began in an S4 voice, hand raised.

No effect on the assembled company.

"Ordah, ordah!" he called at about S6 in his best emulation of that other chairperson in Another Place whom he had heard when Radio 4 went to SW1.

Still no effect. Accordingly, at S9-plus:

"Will you lot darn' well listen to me!" They did.

"Chair, please, gents" from Mister Moneybags as the dissent diminished by a dozen decibels, punctuated only by a sudden "Cor', now you can 'ear an aitch drop!" from Ethelbald.

Proceeded Mister Chairperson: "We've made no progress on our Annual Inquest, so where do we go from here?"

"I'il tell you" ventured The Man of the Club: "Don't let's have an inquest at all. Instead, let's have a local CW contest to see just how bad — or good — we are . . . and I know of at least six Class-B men in the room tonight who would be ready to have a go."

"That we will!" The six chorused almost in unison.

"That's very big of you, TMC" quoth Virginibus: "Only ten minutes ago you said telegraphy was an outmoded and inefficient way of talking over the air — and now listen to you!"

The Man at the Club hung his head in mock humility: "Remember, Virginibus, I did my professional brass pounding for money, and in my years at it I reached the conclusion that there must be better ways of transmitting intelligence. Suggestion: ask someone who did it for love, not for money, how *he* feels about it. Speak up, Old Fangler!" "Please do", added Mister Chairperson.

Old Fangler rose to his feet, adjusted the old timer's badge in his lapel, and drawing a deep breath said:

"When we started our inquest this evening, fellers, we agreed that on the day of The Great Annual Contest everything was A- okay — the gear, the food you grabbed when you came off operating-watch, the logging. Then why didn't we win? Mister Chairperson has told you. It was because our Morse technique was lamentable. Why? Because we didn't pay enough attention to the human factor. Morse-sending, and even more important Morse-receiving, are controlled by the human brain. Put all those automatic digital senders and receivers to work if you like, but they'll never do something only the human brain can do and hat's to winkle out those weak 'uns seven layers below the QRM when you almost need to apply your imagination to what they are saying to you. We'll learn how to do this if we have that local CW contest suggested by TMC. Then p'raps we'll stand a chance in next year's Great Annual. That's enough for me." And O-F sat down.

"Were Cyrus B Clickmeister here this night!" murmured Mister Moneybags as they all trooped out to the tea bar.

ar

GaAsFET LOW-NOISE AMPLIFYING MODULE

Mitsubishi Electric have developed a gallium arsenide field effect transistor (GaAsFET) low-noise amplifying module, which features high gain, for use in satellite broadcast receivers.

Satellite information systems require high performance microwave receivers featuring low noise and high gain, and the performance of such receivers depends on GaAsFET amplifiers.

In developing the amplifying module, Mitsubishi Electric has succeeded in integrating discrete devices into a hybrid IC by using a thick-film ceramic substrate. This has made it possible to manufacture low-noise, high gain receivers for business communications and direct satellite broadcasting systems.

Adapted from Australian Electronic News, March 1986

ZERO DEFECTS

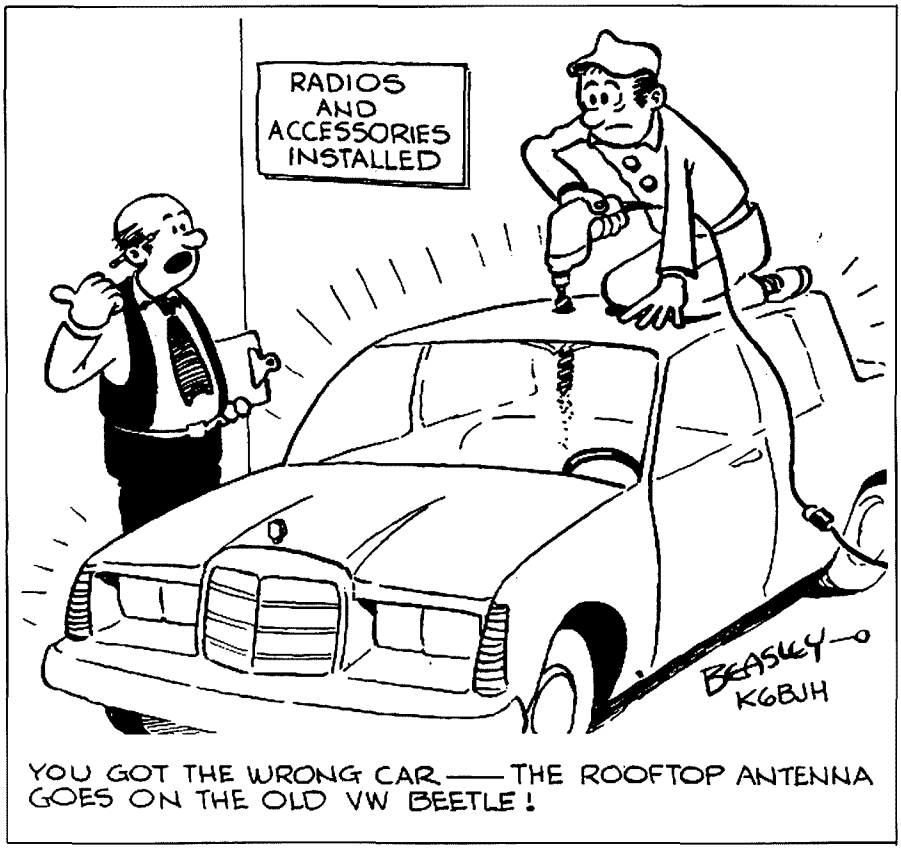
A zero defects warranty, which was implemented in August 1985, has now been extended to cover all integrated circuits produced world-wide by the Philips group of companies.

Under the terms of the warranty a customer who finds a single defect in a batch will be able to return the entire batch for re- screening or replacement.

The warranty applies to all standard-function ICs manufactured after 1st March 1966. Customers will have 30 days in which to report a defective batch.

This warranty means that Philips standard is not 500, 200 or 50 parts per million, but zero.

Adapted from Australian Electronic News, March 1986.



YOU GOT THE WRONG CAR — THE ROOFTOP ANTENNA GOES ON THE OLD VW BEETLE!

Cartoon courtesy WORLDRADIO, February 1986

INVENTORY OF VIDEO TRANSMITTER VENDOR SEIZED

On 16th January, agents of the FCC, the US Marshal and the FBI served a search and seizure warrant on a company in Las Vegas, Nevada. Several thousand dollars' worth of suspected illegal electronic devices and accompanying shipping receipts were removed from the facility.

The warrants were based on evidence developed by FCC that indicated that the company had continued to illegally market electronic devices after having received several warnings from the FCC.

The specific devices, marketed under the brand name of *TV Genie*, were designed to transmit video programming from equipment such as video tape recorders and video cameras to television receivers. The transmitters were being marketed by mail order through advertisements placed in several electronics-orientated consumer publications. In addition to the marketing of such equipment being illegal, use of these low power television transmitters constitutes unlicensed operation and subjects the user to severe penalties. Despite claims to the contrary by some manufacturers, none of the low power television transmitters may be legally sold or used in the US, regardless of the transmitted power.

From The ARRL Letter, 13th February 1986

ARMCHAIR PUNTERS GET VIABET

High technology now allows anyone wishing to bet on the TAB in Western Australia to do so from the comfort of their living rooms. The TAB has linked up with Telecom's Viatel computerised information network to provide what is called a "Viabet" service for home use.

Viatel is a computer-based information retrieval system, which can be switched through to a normal domestic television set.

It was already available for use in 12 000 Australian offices and homes, and the TAB in WA hope it will have 600 regular Viabet users within the next few months.

YES! — Jamboree on the Air Can Be Fun

Noel Lynch VK4BNL
15 Noeline Street, Dorrington, Qld. 4060

After a very long association with Jamboree on the Air (JOTA) — in fact, since its inception in 1958, and at both Scouting and amateur radio levels, I sincerely believe that JOTA can be fun for both amateur operators and the Scout and Guide Leaders. However, like many other facets of our hobby, eg DX, Contests, or in fact any other contact, it has to be worked at to make it a success. Things just don't happen! It is particularly so with JOTA, because in this instance we are involved with others — the Scouts, Guides and their Leaders — who are as unfamiliar with amateur radio activities as we are with their activities. So it is very important to both parties that we really get-together to ensure its success, and provide enjoyment for both sides in this very wonderful national and international experience.

I have personally had a long association with JOTA in both areas, Scouting and amateur radio. In fact, it was thanks to JOTA that I gained my first amateur radio licence in 1972. I participated in the first JOTA in 1958 and in that year and the following two years, was a Scout Group Organiser for JOTA.

It was an honour, in 1961, to be asked by the State Scout Association to accept the appointment as Branch (State) Organiser for JOTA in Queensland, and again in 1964 being appointed as National Organiser for JOTA at National Scout Headquarters level. This latter appointment was held continuously until my retirement in 1984. (My predecessor, Commissioner Peter Hughes VK6HU, has also been involved with JOTA since its inception).

Jamboree on the Air gives Scouts and Guides an opportunity to make friends at an Australian and International level, a chance that would normally be possible unless they attended a national or overseas activity. Such activities are normally only held once every three years, in the case of a National Jamboree, or perhaps at an even greater interval in the case of a World Jamboree. In the present financial climate it would be an opportunity that fewer than two percent of Scouts and Guides would get the chance to experience, particularly at an international level.

By amateurs volunteering their services for JOTA, they are giving Scouts and Guides a rare and unique opportunity and many may be interested to know that many friendships made during JOTA endure over the succeeding years. A Philippine Scout who made contact with the writer during JOTA 1970, still maintains regular correspondence to this day.

There are other *spin-offs* as a result of JOTA. Like many other Scouts, Guides and Leaders, I became an operator through contact with JOTA. When I became involved in JOTA with my group in 1958, the interest engendered in amateur radio through that association prompted seven of my group to seek a further hobby in amateur radio, and due to the good grace of a friendly local radio amateur operator, we were able to form a special study group. The result of this study group was that four of the boys eventually gained their Limited Amateur Radio Operators Certificate. They even shamed me into following in their footsteps, a consequence surely none of us has ever regretted.

I believe it most important that all participants get the most from JOTA. If neither side do, there has to be a reason. The reason can only e that one or the other side, or both, did not work at it, and I stress that both sides must work at it.

At the very beginning of JOTA, both the founder, Les Mitchell G3BHK, and the Scout World JOTA Organiser, Len Jarrett VE3MYF, were well aware of this, so they released the following Guide-lines to ensure that both parties really achieved something worthwhile from their association with JOTA. There is no apology for repeating them now in the hope that they will be of some use to you also. Firstly though, it should be mentioned that this years JOTA commences at midnight, local time, in each country throughout the world, on Friday 17th October, and terminates at midnight (again local time), on Sunday 19th October.

The Australian National Opening Ceremony takes place through VK1BP, located in the grounds of Government House, Canberra, commencing at 0400 UTC on Saturday, 18th.

Amateur operators who may wish to volunteer their services are not expected to make available their services or the use of their equipment for the full 48 hours of JOTA. All or any portion of this period they can spare will be very much appreciated.

Now to the Guide-lines:

A definite need exists for the amateur operator and the Scout and/or Guide Leaders to get-together prior to JOTA. The initial meeting could determine whether the operator wishes to participate at his own shack, or if agreeable to a suggestion from the Scout/ Guide Leader, at the Scout Den or perhaps camp. If the participation is to be away from the operator's shack, he should make quite clear that assistance is required in getting the equipment to and from the site, and in the erection and taking down of antennas. Also, that as the operator will be fully occupied with operating, it should not be unreasonable to expect that assistance will be forthcoming with the provision of refreshments and meals. Most groups are already doing this anyhow

It was thanks to JOTA that the writer gained his first amateur licence in 1972.

Stress that during JOTA, a Leader must be in attendance and this is at all times. This should be made very clear as it is not the intention of either the Scout or Guide movements that operators during JOTA should be acting as sitters. *If at the operator's own shack the group/s should be kept as small as you stipulate, with rostering for other groups to be arranged by the Leader with rostered groups turning up only at the pre-arranged times. The Leader should ensure this, especially by his own presence at all times.*

While initially the approach might be expected by the amateur from the Scout or Guide Leader, any Scout or Guide group not knowing how to make the initial contact would certainly welcome one from an amateur operator. Ensure, though, that any arrangement made with a group is confirmed at least one month prior to JOTA.

It could be advantageous to both sides to inform the Leader that in the interests of JOTA, you would welcome the opportunity to make several visits to the group prior to JOTA so that you could make the Scouts and Guides aware of some of the mysteries of the hobby, in particular, propagation, how antennas work, basic description of amateur radio and perhaps, the phonetic alphabet, and more importantly, intelligent use of the microphone.

A couple of practice sessions with the Scouts/Guides and their Leaders would represent a definite bonus, using radio telephone procedures. The use of a tape recorder would have enormous value and would almost certainly avoid later on the tongue tied *situation, so exasperatingly obvious during JOTA contacts.*

After JOTA, the Scout/Guide group (not the amateur) is expected to submit to their State Scout/Guide JOTA organiser, a log report, including amongst other items, details of contacts, frequencies, and whether contacts were in their own State, inter- State, or overseas. They may, however, seek your assistance there. Their report, when submitted, should also ensure that you, the amateur, will receive a Thank You Participation Certificate. Do not hesitate to let your local group know if you do not receive yours.

The Scout/Guide Leader present should be able to relieve you of all responsibility except actual operating once you have explained what you want done and you should stress this in your pre-Jamboree discussions. The Leader, during JOTA, could introduce the Scout/Guide, having ensured beforehand that some homework has been done by the Scout or Guide in developing a suitable topic for on-air conversation — the group, its size, main interests, information about interesting camps, historical and contemporary details of the local district — farming, industrial, etc — and the Leader should ensure that the Scout/Guide remains until the next over in case some questions need answering. The Leader is also responsible for ensuring silence in the shack during operations.

Finally, good operators ensure that any spare equipment in the shack not actually in use has microphones disconnected while the main transmitter is in service, And for a final final, please note that during the National Opening Ceremony from Canberra on Saturday 18th October, commencing at 0400 UTC (and for a half-hour warm-up period prior to that time) three frequencies are being used simultaneously for the Governor General's and other dignitaries speeches, and for the call backs afterwards. These frequencies are 7.090, 14.190, and 21.190 MHz and your assistance in avoiding these frequencies until 0500 UTC on that date will be deeply appreciated by all concerned with the Ceremony

In your particular State, the Scout Branch Organiser and Guide Liaisons have a Wireless Institute of Australia Jamboree on the Air Liaison who may be of further assistance to you in matters relating to JOTA. A letter to your local Division, or to the State Branch Organiser JOTA, c/- of the address for Scout Headquarters in your State as per the Telephone Book, should bring an immediate response to any queries you may have. Alternatively, an inquiry to the National Co-ordinator JOTA, Commissioner Peter Hughes VK6HU, 58 Preston Street, Como, WA. 6152 will certainly bring a prompt response to your inquiry.

So, do work at your participation in this year's JOTA and good luck and a very enjoyable participation in the 29th Jamboree on the Air. Hopefully the above Guidelines will help you get started this year, if you have not already participated, or if your are a previous participant, ensure an even more enjoyable participation in 1986.

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Photograph from The Story of 25 Eventful Years in Pictures

Lord Baden Powell, founder of the Scouting Movement.

HAVE YOU CAUGHT THE JUBILEE INDUSTRY TRADE TRAIN?

Graham Horlin-Smith VK5AQZ
CO-ORDINATOR JUBILEE 150 COMMITTEE
(WIA SA DIVISION)
2 Athol Avenue, Tranmere, SA. 5073

The Jubilee Industry Trade Train has been out there in VK5-land, just waiting for your next call!

Since 16th March 1986, this train has been busy touring country centres around South Australia. On the train are displays and demonstrations from 30 South Australian companies. Amateur radio communications are also aboard. (The previous look-a-like travelling rail show-case of commerce took place 35 years ago.

South Australia's birthday appears to be an opportune time to re-introduce the Trade Train in keeping with the celebrations which are happening in South Australia. By the time the train returns to Adelaide from 5th-9th June, the quarter of a kilometre long train will have travelled in excess of 4000 km of railway networks during the three-month long program. The Industry Trade Train is one of many major Jubilee 150 projects for 1986, organised by the Industry Executive Committee of the Jubilee 150 Board.

South Australian companies and organisations representing most of the State's major employers and prominent small businesses have taken the opportunity of the 150th celebrations to show as many South Australians as possible the showcase of industrial expertise, innovations and achievements.

The train is based on a series of exciting displays and demonstrations housed in special exhibition cars and visitors are able to look and learn, touch and try. However, the action has not all be *on the tracks*. Platforms and the surrounding areas will form part of the Trade Train display, adding the *fun of the fair-ground*.

Community groups were invited to arrange displays and promotions covering local and district industry, commerce and history. There is also a craft exhibition, sideshows, and a wide range of souvenirs and refreshments — something for all the family).

Local Jubilee 150 Committees, Service Clubs and other community groups also organised activities to coincide with the train's visit. These include historical re-enactments, period costume balls, poster competitions, foot and bicycle races, trade fairs, carnivals and street parades.

The WIA (SA Division) and South Australian amateurs were quick to realise the promotional possibilities both for the hobby itself as well as provide support input to the Jubilee 150 project by way of amateur communications. The opportunity to give publicity outside South Australia and overseas to the train activity and therefore involvement of amateur radio on the train was automatically given the green-light by the train's executive officer, Mr Andre Wilcox and his Committee.

Once again South Australian amateurs have taken to the rails, but with a slight difference. This time volunteer groups from the city and country areas have combined to work from the stationary station on board the train in each of 20 different country locations including Adelaide at the beginning and the end of the journey. These amateurs, by their involvement, are sharing this Jubilee activity with amateurs in Australia and overseas.

The amateur station is situated in a brake-van in Carriage 8, Space F in the middle of the train. This is ideally situated as a communications centre with a static display of amateur radio materials and information for the visitors to the amateur base station. The display has been professionally accomplished again by Peter Koen, whose contribution to the promotion of the hobby has been greatly appreciated.

At each of the designated whistle stops, a fresh team of amateurs take-over — similar to an amateur radio marathon relay. The onboard shack is supplied with quality power from generator cars, with mains power used as a backup at each stop-over, if necessary. Two metre operation is optional dependent upon proximity and the use of repeaters whilst HF operation is equipment provided and worked by amateurs at each location.

Photograph by Peter Koen

Static Amateur Radio Station Display revamped aboard the train by Peter Koen.

Photograph by Graham Horlin-Smith VK5AQZ

Visitors to the station at Mount Gambier were Rendlesham School Teacher, John McKinnon, his wife Josie, nursing young Jack, and John's sister Heather, on the right and the Keeper of the Log Books.

Photograph by Graham Horlin-Smith VK5AQZ

A Carnival Atmosphere surrounded the opening of the Train's Journey.

The Jubilee call sign, VK5JSA/Trade Train offers further points for the Jubilee 150 Award. For those interested in the Jubilee Award, the Trade Train is a new activity and is worth 15 points for the initial contact for each of the bands the station is worked. An additional five points can be claimed for the Award for each country location that the train is worked. Club and operator call signs activated from the train offer additional points.

A special, one-off, one contact QSL card for the Trade Train Award can be sent to the WIA (SA), Box 1234, Adelaide, SA 5001, (marked *Trade Train Award*) for $2 packaging and mailing. This Award had become quite popular to follow on from the Cape Willoughby, Kangaroo Island Jubilee 150 Award.

The train will be in Broken Hill on 29th-31st May and in Adelaide from 5th-9th June. Frequencies operated are 28.470, 21.186, 14.186. 7.086 and 3.586 MHz. The prime net frequency is 3.586 MHz and meets every Tuesday, Friday and Sunday at 1000 UTC.

Several further activities are planned for the Jubilee 150 Year including Rail Mobile from Adelaide to Alice Springs and return in June, the City of Marion Centenary Celebration and a special activity for the Grand Prix in October.

Novice Notes

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

THE OPEN WIRE FEED, HF MULTI-BAND DIPOLE

Most solid-state transceivers require a load ot nominally 50 ohms for correct operation. If the antenna presents an impedance which departs too greatly from this value, circuitry which monitors the SWR (in most transceivers) will cause the drive power to decrease in an attempt to protect the output amplifier. For a coaxial fed antenna, line losses will also increase in proportion to the degree of mismatch. The connection of an antenna coupler or tuning unit between the radio and antenna will probably permit the output amplifier to *see* a 50 ohm load, but beyond the coupler, towards the antenna, the degree of mismatch and resultant high SWR will be unaltered, so line loss will remain. The amount of loss will depend on the quality of the coaxial cable.

One of the most popular all-band antennas for many years has been the horizontal or inverted-vee wire, fed with low-loss open wire feeders. The reason for the popularity is easy to explain. Just about any length wire — as small as one-quarter wave-length long on the lowest band, will yield reasonable results, and really good performance can be expected on all bands where the radiating portion is longer than one-half wave-length. Any convenient feedline length (although some lengths will provide easier matching) may be used. Even is a very high SWR may exist, losses will be acceptably low, as the main dielectric is air. Because of the physically flat nature of the feedline, it is generally simpler to get it indoors than for coax. For example, the line may be passed through the gap between a window and frame and still allow the window to be closed, so avoiding the need to drill holes and so on. This applies especially to the low-loss television-type line (Figure 2). There is one pre-requisite with this antenna however, in that a tuner is an essential requirement.

The tuner performs three main functions:

** Provides a match between the nominal 50 ohm impedance requirement of the radio, and the complex, usually unknown impedance at the station end of the feedline.*

** Interfaces the unbalanced coaxial input/ output of the radio to the balanced feedline and antenna.*

** Significantly reduces the level of any harmonics, and provides some pre-selection for the receiver.*

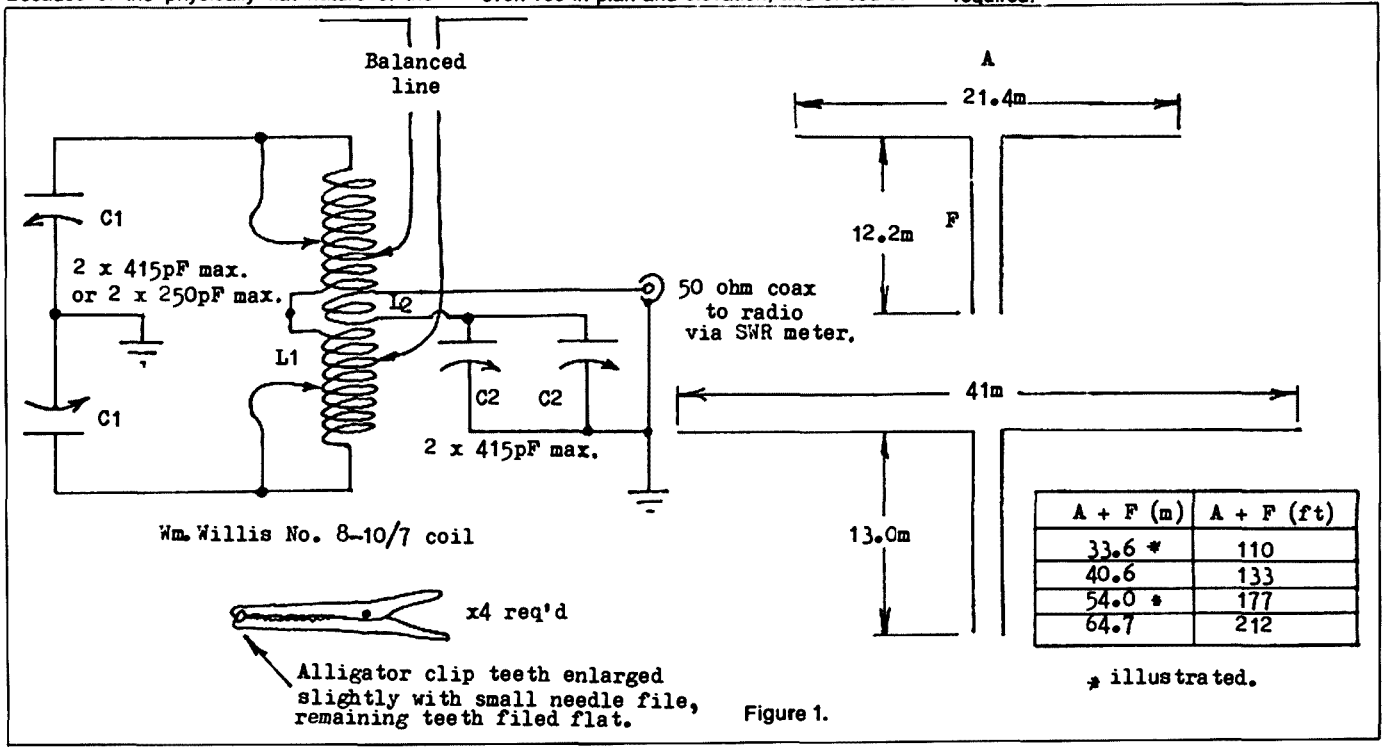
Because of the voltages and impedances involved, it is generally not possible to perform the matching function with broadband transformers and baluns. More about the tuner later.

ANTENNA

The top radiating portion of the antenna may be just about any convenient length that may be fitted into the physical boundaries of the property. It may be *flat-top* or *inverted-vee* or even vee in plan and elevation, and of course the wire should be located as high and in the clear as is reasonably possible. The author has used various forms of this antenna, the smallest being only 15 metres of radiating portion and six metres in height, to the present configuration which is 41 metres and 13 metres respectively. Two systems which are shown in Figure 1, and the table shows some more dimensions that should prove satisfactory. See also References 1 and 2. The trade-off between radiating portion **A** and feedline F is not critical. However, aim for as much wire in **A** as is readily possibly consistent with A + F

Ordinary electrician's earth wire is Ideal for the radiating portion, and the feedline if home-made open wire feeders are planned. Figure 2 shows the most commonly available feedline options. The insulators for the ends and feed connection point should be porcelain or glass *dog-bone* type with long leakage path. Avoid the ordinary *egg* type. If an inverted-vee configuration is used, three such insulators should be employed. See Figure 3. Note that the strain must be relieved from the feedline connection by passing these wires through the holes of the insulators, as shown.

As an alternative to the insulators mentioned above, teflon rod, about 1.5 cm diameter can be obtained from electrical insulation wholesalers. Sufficient stock to make three or five insulators of about 7 cm each will be required.



A + F (m)	A + F (ft)
33.6 *	110
40.6	133
54.0 *	177
64.7	212

* illustrated.

Figure 1.

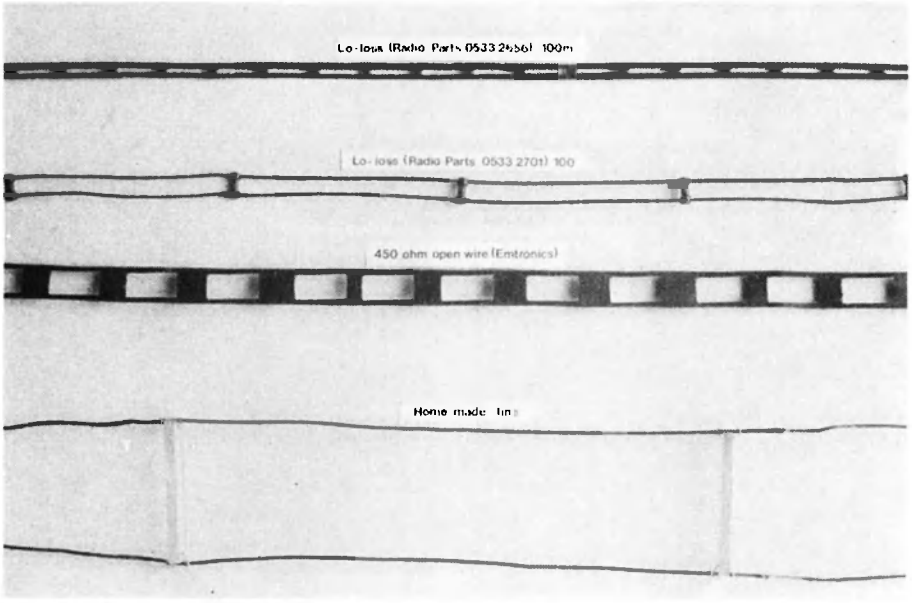


Figure 2.

shafts of these two capacitors are nominally at RF earth potential, so no special insulating precautions are necessary.

TUNER ADJUSTMENT

By experimenting with the position of the taps for C1, the antenna connections, and adjustment of C1, band noise will be maximised to a point where no further adjustment causes a worthwhile increase in noise or signal levels. It will be found that near maximum C will be required at C2, so this may be set at full mesh for starters. Now, on a clear channel, apply a bit of carrier from the radio and observe the SWR reading. It should be possible to bring the reflected reading down to a small value with adjustment of C1 and C2. If a reading of near zero cannot be obtained, switch off carrier and try moving either the capacitor or antenna taps closer to, or further from the centre of the coil. **Do not touch the coil or feedline whilst carrier is applied!** When the ideal or best positions are found, record them. Remember that the antenna and coupler are symmetrical, so the capacitor and antenna taps must be positioned an equal number of turns from the centre, with the antenna taps always closer to the centre than the capacitor taps. If you are unlucky enough to have a feedline length that will just not allow you to obtain a satisfactorily low SWR on one or two bands, experimentally add about one metre of feedline and try again, checking to

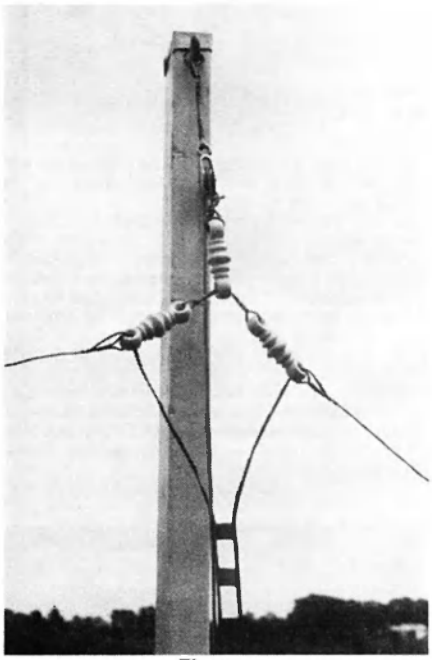


Figure 3.

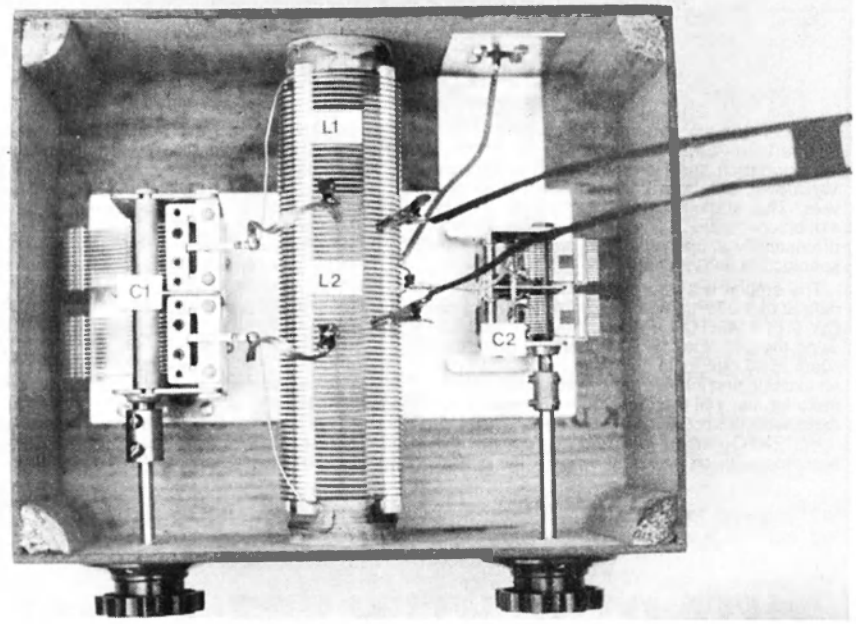


Figure 4.

Poly robe — the kind used by yachtsmen, may be used for the halyards, but it is very expensive, and deteriorates in just a few years of weathering. A cheaper and more lasting alternative is the green plastic covered steel clothes line wire sold in lengths at hardware shops.

TUNER

The circuit of the suggested tuner is shown in Figure 1. Variable capacitors of any kind have become very hard to obtain now, and to my knowledge, all production has stopped in this country. People who have been in radio for some years always seem to have a few going spare. If you know such a person, I can only suggest that they be approached for a donation. The coil is a factory-made one, available from William Willis & Co Pty Ltd, of Canterbury, Victoria.

To reduce the possibility of electric shock, the tuner components should be housed in some sort of enclosure. For simplicity and ease of construction, a wooden box is suggested. See Figures 4 and 5. This method allows us to mount the coil upon discs of wood glued to the front and rear panels without incurring eddy current losses as would be the case with a metal enclosure. Note that a strip of metal runs beneath the two variable capacitors to form a continuous ground connection between these and the coaxial connector fitted to the back panel of the box. The braid from RG-58 coaxial cable may be used for inter-connections.

The link coil, L2, is formed by isolating three turns in the exact centre of the coil L1. The free ends of L2 should be brought out to the side of the coil, and the centre ends of L1 rejoined as shown in the circuit. Do not earth L1.

If only low power operation is contemplated, C1 may be an ordinary dual-gang broadcast capacitor. These are not too difficult to find. For higher power work, C1 must have wide spaced vanes. A dual-gang 200 or 250 pF unit would be fine for this. C2 may be a dual-gang 415 pF BC type, even for power levels to the legal limit. The

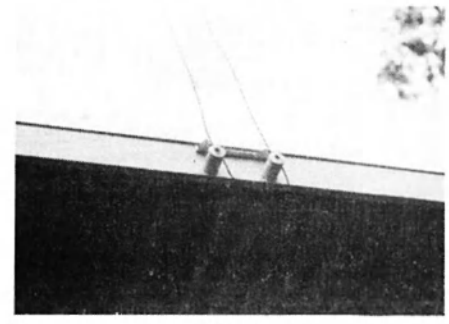


Figure 6.

make sure that the other bands have not been adversely affected.

LIGHTNING

It is doubtful whether anything will protect equipment from a direct lightning strike. However, a strike in the vicinity of an antenna can induce tremendous voltages, and something positive can be done about this. Fortunately, with this tuner, a spark gap is already provided by the vanes of capacitor C1. It is good practice to disconnect the feedline from the tuner when not in use. In addition, a spark gap, external to the station should be provided. Figure 6 shows the authors feedline on its way to the shack and making use of the grounded metal roof of the garage as the grounded body.

References:

1 Wire Antennas — William Orr; Radio Publications.

2 Radio Communication Handbook; RSGB.

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From QST
— December 1985

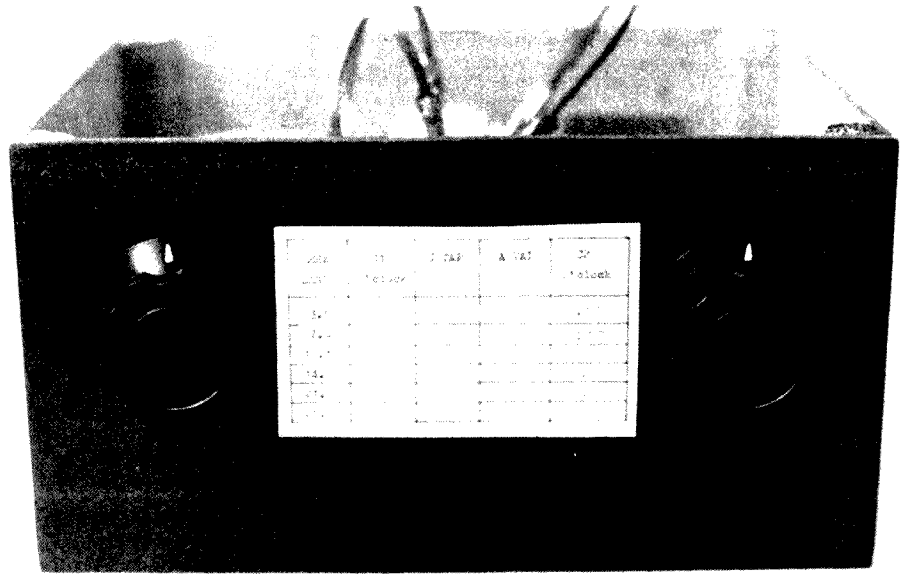

Figure 5.

AMATEUR RADIO AT EXPO 86!

A state-of-the-art amateur radio station will be featured at Expo 86, the World's Fair on Transportation and Communication being held in Vancouver, BC, from 2nd May to 13 October this year. The station will be located in the main exhibition hall of the Canada Pavilion, dramatically *anchored* in one of the world's most spectacular harbour settings.

The station will operate on all bands from 160 metres to 1.2 GHz, and all modes including SSB, CW, RTTY, AMTOR, Packet, FM, ATV and SSTV using the call sign VE7EXPO. It will operate from 10am to 10 pm (local time) each day, and provide an exciting and interesting introduction to amateur radio for many of the more than 13 million visitors expected at Expo 86.

VE7EXPO, which will feature Icom's newest equipment on all bands, will have five operating positions — one each for packet, satellite and VHF/UHF, and two for HF HF antennas include a multi-band Yagi, verticals and home-brew bazookas. The satellite system will use two 14-turn helixes on 434 and a pair of 22 element Yagis on 144 Mhz.

The packet station uses the latest VADCG TNC+ packet radio interface, and a computer system to allow the public to ask questions about amateur radio — via a packet radio link to the VADCG's (the pioneers of packet radio in North America) bulletin board. The TNC+ can use the Vancouver V2 and V3 protocols as well as AX.25, so packeteers are encouraged to link to the station as well.

The station will be active during as many contests as possible, and count as a special 20 point bonus station during the 1st July Canada Day Contest. All contacts will be QSLed through the VE7 Bureau, with outgoing cards via the CARF outwards bureau.

VE7EXPO will be manned entirely by volunteer amateurs and provide, not only a massive public relations opportunity for amateur radio, but an information centre for many non-local amateurs. Local repeaters on 146.940, 224.300 and 443.525 MHz will be monitored in case visiting amateurs need directions, etc.

Visiting amateurs are encouraged to drop by and operate (with a valid licence or call book address). Amateurs who wish to take part as a group, or who wish to arrange scheds for special events should contact the VE7EXPO Amateur Radio Society, 202 — 13640 67 Avenue, Surrey BC Canada, V3W 6X5.

Contributed by Robert Smits VE7EMD

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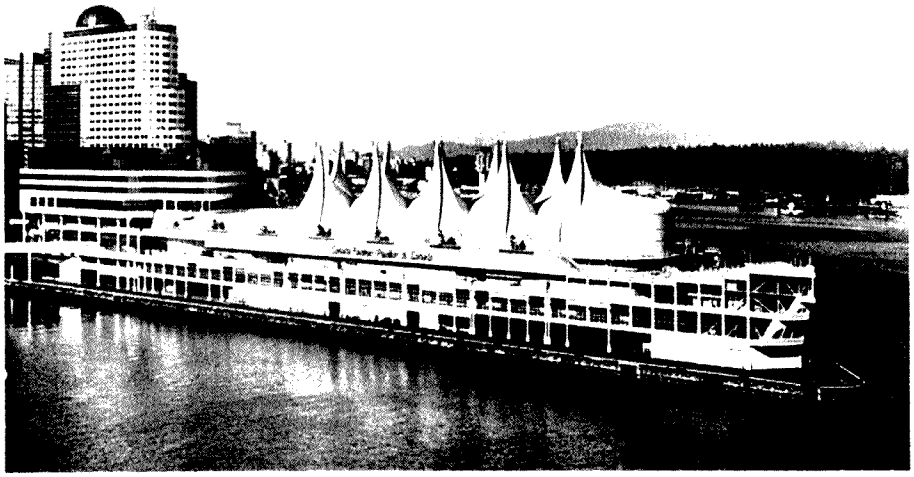
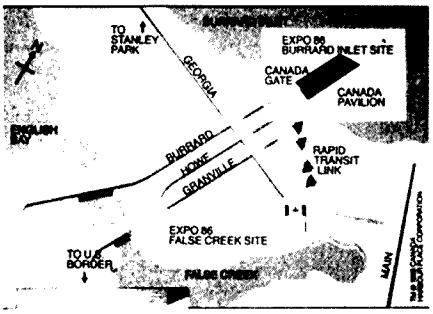
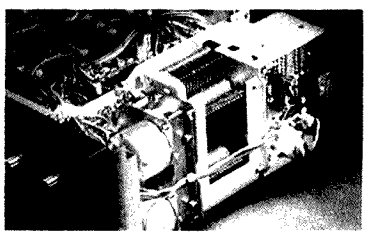




Canada Pavilion at Expo 86 — Spectacular Canada Place is the harbour-front site of the Canada Pavilion at Expo 86 in Vancouver. The flagship of Expo will showcase Canada's finest technological and cultural achievements. The ship-like structure also houses a cruise-ship terminal, the Pan Pacific Vancouver Hotel and World Trade Centre office complex, and the CN Theatre, the world's first three-dimensional theatre. After Expo 86, the pavilion will become a world-class Trade and Convention Centre, the largest facility of its kind in Western Canada.

KENWOOD

TS-440S



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International News

18th WORLD TELECOMMUNICATION DAY

Partners in progress: governments, operating entities, manufacturers and users was the topic chosen by the Administrative Council of the International Telecommunication Union (ITU) for the 18th World Telecommunication Day, which is celebrated annually on the 17th May. This day commemorates the founding of the Union in 1865, under the name *International Telegraph Union*, by the delegates of 20 States signatories of the International Telegraph Convention, the first intergovernmental treaty for the regulation of international telegraphy.

Towards Universal Telecommunications

Paris, 17 May 1865: the Plenipotentiaries of 20 states, moved by the wish to establish a permanent understanding among themselves, signed the International Telegraph Convention creating the International Telegraph Union, later to become the International Telecommunication Union.

At this time, the industrialisation of certain regions of the world called for increasingly reliable and swift communications. Although the telegraph was already widely used within many states, the creation of a genuinely international telegraph network came up against a man-made barrier, the national frontiers, at which the telegraph wires usually ended.

The International Telegraph Convention of 1865 therefore provided measures aimed at overcoming this obstacle and promoting the development of a world-wide network.

As the first inter-governmental treaty applicable to a public service, the Convention — to which every sovereign state was at liberty to accede — contained the concept of universality which was to become an inspiration for the action of the countries Members of the Union.

The first stage consisted in the standardisation of operating and accounting methods from amongst the different technical possibilities: every major innovation in communications was swiftly matched by specific Union action to make use of the new discovery in the world network.

The history of the ITU in this respect reflects that of the technological development of telecommunications.

For example, the invention of the telephone in the 1870s led to the adoption at Berlin in 1885 of the first regulations governing the international telephone service.

The invention of radiotelegraphy at the end of the last century led to the signing of the International Radiotelegraph Convention at Berlin in 1906.

In the 1920s, the introduction of new services such as broadcasting and the growing complexity of the techniques employed prompted the countries Members of the Union to allocate the frequency bands and to set up Consultative Committees to prepare international standards.

At Madrid in 1932, the Plenipotentiaries of the Union emphasised the universality of telecommunications by deciding to merge the International Telecommunication Convention and to rename the organisation the *International Telecommunication Union*.

Closer to out own times, the intensive use of radio communications necessitated the creation of an international board to manage the frequency spectrum. The dawn of the space age in 1957 impelled the Union to adopt regulations for the space services.

A world-wide integrated network was thus gradually constituted through the will of the ITU Member countries, accompanied by the affirmation of the concept of universal telecommunications at the service of every member of the human community.

This evolution was greatly assisted by the decision of the Plenipotentiaries, meeting at Atlantic City in 1947, to make the Union the United Nations specialised agency for telecommunications.

Having become part of a large pattern, the ITU actively co-operated with the other specialised agencies in implementing the United Nations Development Program.

Design and installation of national and regional networks, training and the preparation of plans — particularly for radio communication services — intended to safeguard the legitimate interests of all countries regardless of their technical capacity at any given time: ITU action now recognised the role of telecommunications as a key to social and economic development.

This role was reflected in the work of the 10th ITU Plenipotentiary Conference, held in Nairobi in 1982, which as the very Preamble to the Convention signed by the Member countries affirms, took its decisions *having regard to the growing importance of telecommunication for the preservation of peace and the social and economic development of all countries."*

Thus, the Nairobi Conference marked a turning point in the history of the Union which, while continuing regulation, standardisation, coordination and planning activity, also committed itself to the task of redressing the enormous imbalances in telecommunications development.

For this purpose, the Plenipotentiaries set up an Independent Commission of 17 wise men representing all continents and with the assignment of producing specific proposals designed to put an end to this unacceptable situation . . .

. . . Proposals whose importance was stressed by the ITU Secretary-General, to whom they were submitted in 1985.

These proposals, calculated to motivate the international community and national authorities alike, might, if implemented without delay, turn the tide. Within 20 years they might place within reach of every person on Earth, in whatever region, a long-distance communication service, namely, the telephone, for the greater benefit of all communities and all nations.

Thus 1985, the 120th Anniversary of our Union, under the slogan of telecommunications for development, may also go down in history as the real starting point of the era of universal telecommunications.

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TELECOM 87

Telecom 87, the fifth in a series of world telecommunication exhibitions, will be held from 20th to 27th October 1987 at Geneva's exhibition and conference centre — Palexpo.

Under the theme *Communications Age: Networks and Services for a World of Nations*, Telecom 87 will bring together over 600 exhibitors from all parts of the world and will display, on some 65 000 square metres of indoor and outdoor space, the state-of-the-art in equipment and technology. Telecom 87 will also give a glimpse of the future in the rapidly evolving field of telecommunications through demonstrations of prototype equipment yet to come to the market. Telecom is for many manufacturers an occasion to unveil new products and to indicate what is on their R and D drawing board.

World telecommunications exhibitions are organised by the International Telecommunication Union in accordance with a formal opinion adopted by the ITU Plenipotentiaries, in view of their valuable role in keeping the members of the Union informed of the latest advances in telecommunication techniques and in publicising the possibilities of applying telecommunication science and technology for the benefit of the developing countries. ITU world telecommunication exhibitions are recognised as the world's largest and most universal telecommunication exhibitions.

Public and private sector operators, as well as manufacturers and suppliers of telecommunication equipment of 34 countries are already participating in Telecom 87. These are: Australia; Austria; Belgium; Brazil; Bulgaria; Canada; China; Czechoslovakia; Denmark; Finland; France; Federal Republic of Germany; German Democratic Republic; India; Indonesia; Islamic Republic of Iran; Israel; Italy; Japan; Republic of Korea; Kuwait; Libya; Malaysia; The Netherlands; New Zealand; Portugal; Saudi Arabia; Singapore; Sweden; Switzerland; United Kingdom; United States; USSR and Yugoslavia.

Amidst the many facets of Telecom 87, a number of other important related events will take place, such as Forum 87; Book and Audio Visual Fair; 1987 Golden Antenna Film Festival and Youth in the Electronic Age 87.

Equipment Review

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

KDK FM-240 TWO-METRE FM TRANSCEIVER

It is exactly 10-years since I reviewed a KDK FM transceiver. This was the FM-144-10SXR and was one of the first full-coverage synthesised transceivers to appear on the local market. Several updated models have appeared since, but unfortunately none have been offered for review However, it is interesting to look at the developments that have occurred over that 10-year period. The most obvious is the size and weight. The new FM-240 is just a fraction over half the size of the original and just under half the weight.

In addition to this, it has the capability of delivering twice the power output of its predecessor.

KDK equipment has not enjoyed a good reputation for reliability over the years. The early models suffered from poor soldering and many of the original models that are still on the air have alignment problems, particularly in the frequency determining section. Let us hope that the current model has a better record in the years to come.

FEATURES OF THE FM-240

The FM-240 is a compact two metre FM transceiver, and is, in fact, the smallest 25 watt FM transceiver on the market at the moment, just beating the Icom IC-27 by a small margin in both size and weight. However, it possibly achieves this by omitting an internal loudspeaker which the IC-27 has, albeit of rather poor quality. The FM-240 is supplied with a microphone/speaker unit.

A multi-purpose LCD readout keeps the operator supplied with all the information ever required. Apart from the operating frequency, it indicates VFO or memory operation, repeater offset, reverse repeater operation, receiver S-meter and transmitter output indicator plus scan and call channel operation. Other functions are also displayed during the memory set-up procedure, as we will see later.

All memory information is retained when the DC supply is removed by a lithium battery. It appears that the programming of the CPU is not dependent on the lithium battery as it is with some other brands. An optional speech synthesiser is available to announce the operating frequency but was not supplied with the review transceiver. A tone squelch facility is included to provide a selective calling function. Repeater offset can be varied from the standard 600 kHz if required. Frequency and memory selection is from either the tuning knob on the front panel or via the up/down buttons on the microphone.

Transmitter power output is rated at 25 watts with high power selected or five watts low power.

ON-AIR

The FM-240 was used as both a fixed station and as a mobile and was found to be easy to set up and use once I understood the setting-up of the memory facility. The instruction states that the rig has *User Friendly Man Machine Interface*. I did not find this to be entirely true and the instruction book was not as clear as it could have been. I feel that most operators would use the transceiver principally in the memory mode — in other words, fill up the 16 memory channels with all normally used frequencies and only resort to the VFO for the odd unusual frequency.

To enter a memory, it is necessary to go through several steps for each. These in turn, frequency, tone selection for the CTCSS mode, scan mode required for that channel and finally the selection for simplex, duplex or cross (transmit facility on the frequency in the next memory). Once each of the above has been selected it is necessary to *hit* (their word), the enter button. The readout then displays the next command and the various alternatives are selected by turning the tuning control. When selecting frequency, two tuning speeds are available, either 5 kHz or 50 kHz and these are selectable with the *speed* button above the tuning control.

Although stated as such, the FM-240 has two VFOs. The *OSY* button enables the operator to select any other frequency away from the one in use, be it either a VFO or memory selected. The OSY switch then enables selection of either the original or the new frequency.

While all of this hitting and entering is going on, the transceiver beeps when you have done the right thing. The *beep* also alerts for activity on the priority channel. I thought that the beep was a bit anaemic in character and certainly not up to the Kenwood system which is amplified through the receive audio channel.

In common with many contemporary transceivers, the FM-240 has a LCD display. While it displays an incredible number of functions, I found it to be rather dull and lacking contrast. The rear illumination is an off-white colour and the digits a rather light black. Perhaps a change of the illumination colour may help.

Overall the front panel presents a very pleasant perspective to the user. One interesting feature is the recessed microphone connector but unfortunately the standard microphone plug is rather hard to tighten up. By the time it is tight, the knured ring is flush with the front panel, so it is advisable not to cut your fingernails prior to plugging in the microphone. A connector with a longer locking ring would overcome the problem.

In use the microphone/speaker was quite handy. Memory channels could be selected by means of the up/down buttons on the top, or a lock switch at the rear could remove this facility. As is usual with microphone/speaker units, the received audio quality left quite a bit to be desired and then there is the problem of what to do with it when it takes two hands to drive the car! Even a small external speaker produced very superior results.

For mobile use, a handy mounting bracket is supplied as a standard feature, along with a selection of mounting hardware.

UNDER TEST

Frequency Stability and Accuracy: Under hot or cold conditions, the FM-240 was within 100 Hz of the displayed frequency. The 600 kHz offset for repeater operation was also better than 100 Hz

Power Output: The power output was measured with exactly 13.8 volts DC applied to the transceiver. On initial switch-on and the transceiver at ambient temperature 18 watts was delivered, however, as the rig warmed up on receive only, this dropped to only 15 watts. With intermittent transmit periods, this dropped again to 13.5 watts. The results were very disappointing. Two different transceivers were tried with similar results. Low power out was checked at 2.5 watts. Again this was well below the specified power. It is suspected that the low power setting may be internally adjustable, but no information is supplied on this.

On the bright side, it was found that the supply voltage could be dropped to 11 volts with very little drop in transmitter power output. Current drain at 18 watts output was 4.9 amps and at 2.5 watts output 2.6 amps. With the transceiver hot and at the lower output power this had dropped to 4.5 and 2.3 amps respectively.

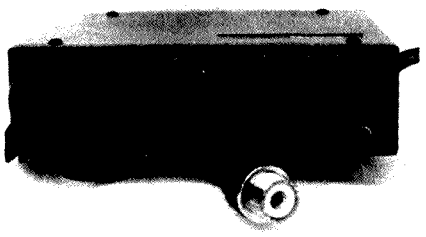
Transmit audio quality was rated as fair. Reports indicated that the speech was rather thin and edgy. Deviation setting appeared to be satisfactory.

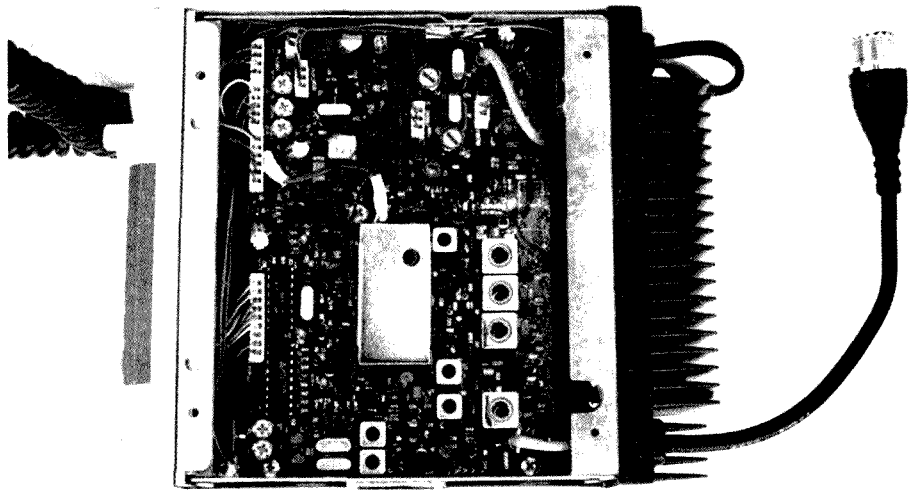
Receiver Tests: Receiver current drain was checked with 13.8 volts applied. With the receiver squelched 480 mA. With 250 milli-watts, audio output was 520 mA. The receiver extension speaker output was terminated with an 8 ohm load. Maximum power output was 1.75 watts with one watt at the onset of audible distortion (about five percent). At .5 watts output, distortion was measured at 1.5 percent.

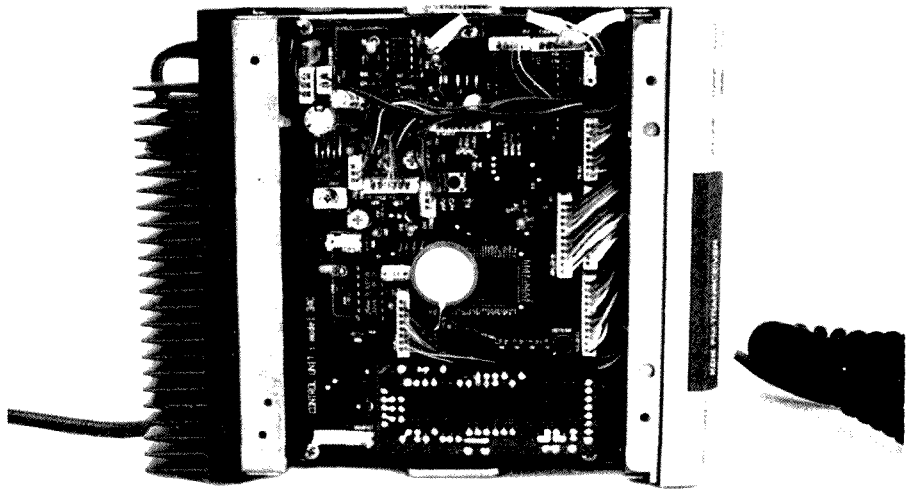
With a four ohm load, the maximum power output increased to 2.5 watts. Receiver noise was measured with a 100 micro-volts input signal with no deviation. This was -28 dBm unweighted and -32 dBm weighted.

Receiver sensitivity was next checked. At one micro-volts input with 1 kHz modulation and 3 kHz deviation, SINAD was 28 dB and S/N ratio 31 dB. A 12 dB SINAD figure was obtained at .6 micro-volts. The mute opened at .15 micro-volts. The S-meter on the FM- 240 consists of seven segments on the LCD display calibrated at S 1; 3; 5; 7; 9; +10 and +20. The following results were recorded:

S1 — 2 micro-volts; S3 — 6.3 micro-volts 4 dB; S5 — 10 micro-volts 4dB; S7 — 16.6 micro-volts 2 dB; S9 — 20 micro-volts 2 dB; +10 — 25 micro-volts 6 dB; +20 — 50 micro-volts.







This gives a total range of only 18 dB from S3 to +20. S units on two metres are apparently only 1 or 2 dB. It was also noted that the S1 segment would indicate when the squelch opened even when no signal was present.

As mentioned earlier, the FM-240 has no internal speaker. Instead, a microphone/speaker is supplied. The received audio quality is therefore rather thin due to the size of the speaker. It also limits the actual audio power output because of its inefficiency. In most applications, a reasonable quality external speaker does a far better job. It is a pity that KDK did not supply an external speaker as standard equipment as Kenwood do with some of their current model FM transceivers.

Perhaps the most disturbing aspect of the receiver performance is the spurious and cross-modulation responses. These appear to be a combination of both internally generated and those produced by external strong signals. To leave the transceiver scanning either the memories or a band scan produces a variety of peculiar noises which in many cases wipe out wanted signals. It also brought up the alarm for the priority channel when there was no signal present.

Just to prove the point on this, the transceiver was taken to a quiet country area, but much the same thing happened and, in fact, made it unusable for our requirements.

Instruction Manual: The instruction book has a total of six pages, of which the first is the introduction and index. It is purely an operations book. The text covers all aspects of using the transceiver, but there are no drawings or illustrations with the exception of a front panel photograph on the front cover. A series of display representations, say with the memory entry sequence, would be of enormous help. Apart from a circuit diagram, there is no technical information at all.

CONCLUSIONS

With so much in its favour, it is a pity that the FM-240 falls short in several important aspects. However, at the current price it represents good value. The review transceivers were supplied by Emtronics Melbourne.

The following test equipment was used to produce the test figures stated in this article. A Yaesu YP-150 and Marconi TF-957/1 Terminating RF Watt Meters; AWA F242A Noise and Distortion Meter; Daven Terminating Audio Output Meter; Ramsay CT-70 Frequency Counter.

EVALUATION AND ON-AIR TEST OF KDK-240 TWO-METRE FM TRANSCEIVER — Serial Number 000411

Appearance

Packaging
* * * Strong carton with foam inner section.

Size
* * * * At this time, the smallest FM transceiver on the market.

Weight
* * * * At only one kilogram, the lightest full feature FM rig.

External Finish
* * * Very clean attractive finish.

Construction
* * * Good quality circuit boards and neat wiring.

Front Panel

Location of controls
* * * Apart from some push-button controls, which are rather small and close together, most frequently used controls are quite accessible.

Labelling
* * Like some of the controls, the labelling is small.

LCD Readout
* * Although the readout presents more information than others, its readability is only fair. More contrast needed.

Receiver Operation

Memories
* * * * One of the best 16 memories with frequency, off-set, scanning mode and other information.

S-Meter
* * With a total range of 18 dB, only just satisfactory.

Spurious Responses
* KDK need to look carefully at this. Not vaguely comparable with current Icom and Kenwood equipment.

Sensitivity
* * Could be better, but over all spoiled by spurious responses.

Received Audio
* Quality and total audio output from speaker/microphone poor. Noticeably better with external speaker.

Transmit Operation

Power Output
* Not up to specifications, and even then drops off as the unit heats up. Should be much better.

Transmit Audio
* * Rather peaky quality. Fairly good intelligibility though.

Cooling
* * Heat sink runs rather hot. Location of transceiver should be carefully considered.

Manual

Owners Book
* Covers most operational functions in a fair way, but no technical information apart from a circuit.

Overall Rating
* * Just satisfactory. In other words, try one before you buy. Depending on what you have used previously, you may be either happy or very unhappy!

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FIBRE OPTICS

Satellites now used for inter-continental and international communications are being challenged by fibre optic technology.

The United States Cable and Wireless Company is now laying the first of two privately owned Trans-Atlantic fibre optic cables between New York and London.

The Overseas Telecommunications Commission is involved in submarine fibre optic cable, planned to run between the US mainland and Japan via Hawaii, being funded by a consortium of countries.

Australia and New Zealand will be linked by fibre optics in the next five years.

In Australia, fibre optics are playing a major role in the development of the country's telecommunications infrastructure. This technology is being used for high capacity inter-exchange links and to meet the needs of digital communications.

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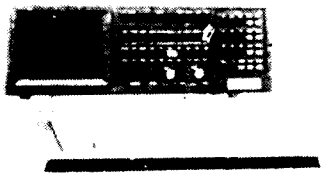

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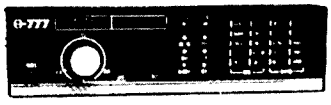

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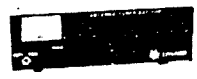

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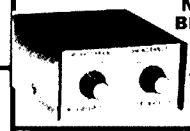

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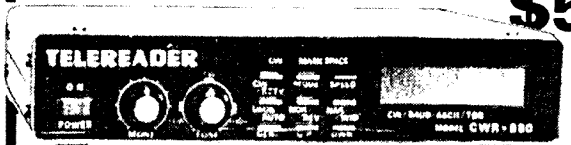

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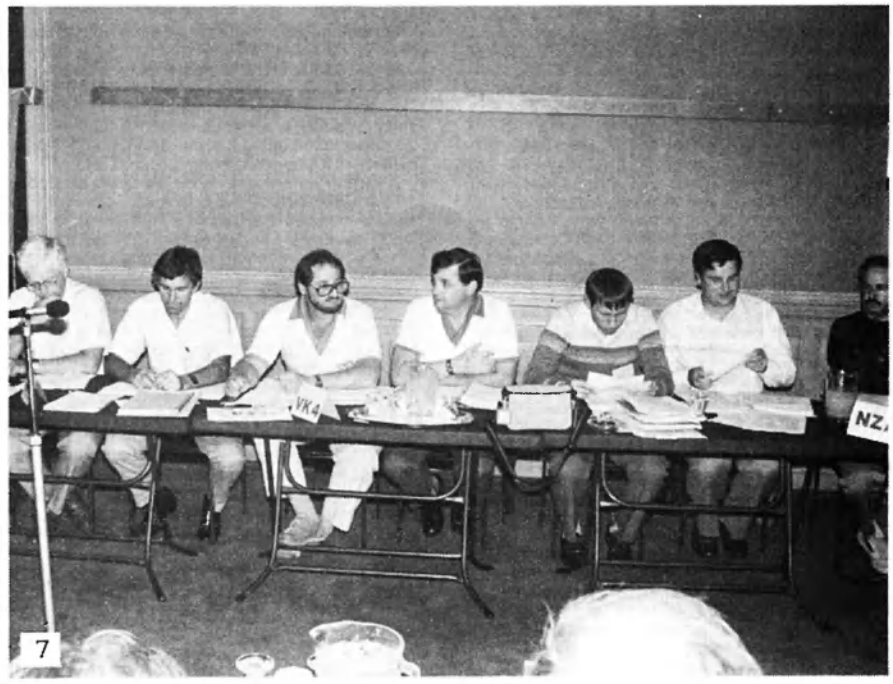
W I A 50th ANN

UAL CONVENTION



The 50th Annual WIA Convention was held in Melbourne over the ANZAC Weekend. Federal Executive Members, representatives from all Divisions and two guests from NZART were in attendance.

The Convention Theme was ***Take Amateur Radio and with it the WIA into the 21st Century.***

These photographs show some of the faces that were seen at the Convention.
1. From left: Tim VK2ZTM; Jeff VK2BYY; Wally VK2DEW; Graham VK5AGR; Rowland VK5OU and Don VK5ADD. 2. Max VK3ZS. 3. Kevin VK1OK; Alan VK1WX and Ron VK1KRM. 4. Rear: Greg VK3BGW, Bruce VK6OO (partiaiy hidden), Peter VK3AVE. Front: Neil VK6NE; Des VK3DES and Alan VK3BBM. 5. Brenda VK3KT. 6. Convention Attendees. 7. From left: Peter VK7PF; Joe VK7JG; David VK4YAN; Guy VK4ZXZ; Ross VK4IY; David VK4NLV and Terry ZL3QL (who represented the NZART together with Jock ZL2GX. 8. Executive members Bill VK3ABP; Ron VK1RH; David VK3ADW and Allan VK3AE. 9. Barry VK3XV; Tim VK2ZTM; Jeff VK2BYY and Wally VK2DEW.

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.020	JA6YBR	*Japan*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JO1YAA	*Japan*
52.013	P29BPL	*Loloata Island*
52.020	FK8KAB	*Noumea*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.465	VK6RTW	*Albany*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

No significant changes to the beacons this month. I have left out some of the ZL six metre beacons and left a couple around the centre of our band which should be sufficient to act as a warning if conditions are suitable. Additionally, the quite high level of ZL activity during the past two years assures contacts without a great deal of trouble. One of the best pointers to New Zealand contacts are still their Channel 1 television stations around 50.750 MHz and with many transceivers having a scanning mode fitted, it is quite easy to program coverage of the television station.

In the March issue of *The West Australian VHF Group Bulletin* there is a list of all the beacons operating in that State, a total of 17. In fact, if you include the two on 28 MHz, which are the only ones not listed in our beacon list. I note also that VK6RTT is shown as being at Port Samson, although I list it as being at Wickham. However, those two places and Karratha are all so close together I seem to remember when I was there in 1982, that it probably does not matter!

MACQUARIE ISLAND

Gil VK3AUI, sends a letter which reads in part, *"After a great flurry and instant preparation, the six metre gear returned to Macquarie Island with Sojo VK0SJ. Not only six metres, but two metres as well. Sojo has taken his own two metre transverter with him. A new keyer output, together with a two metre beam and an amplifier were got together over a weekend and shipped to Sojo. Frequencies are 52.150 and 144.150 MHz.*

"Sojo has been down south before, also to Heard Island with Jim Smith, so is a seasoned expeditioner.

"The additional gear and the original gear are courtesy of the following: VK3s NM; BDL; XQ; GJ; IQ; YTB; AUQ and AUI. The rally around to get the six and two metre gear together was really something. I got the phone call late on a Thursday night and the gear was shipped on Tuesday! QSLs will be via VK7RM, QTHR."

It is to be hoped after all the effort that Sojo does make some contacts and in so doing, give some more amateurs an opportunity of working VK0. It would be great if it could be done on two metres, hardly anything seems totally impossible these days.

Gil goes on to say that *"lately I have been mainly on 144 and 432 MHz working aircraft enhancement. Have made it to VK1 on 432 and 144, and into VK2 on 144. Others involved include VK1BG; VK1GL; VK1VP and VK2DVS.*

"Was very pleased to work VK6AQM (Esperance) on 26/1 on 432 using only 10 watts. The 50 watt amplifier was away on loan. Also worked VK7ZIF on 14/3 on 432 and 144. Ian lives in Hobart."

Gil also passes on an experience he had with a Dick Smith GaAsFET preamplifier. As received it was off frequency and had a poor noise figure. Eric VK3ZSB, tuned it up to 0.6 dB NF, which indicates a good performance. It had originally been tuned on a spurious response. Quite a trap! Gil hopes to be using it soon. Although not stated, I presume it was a two metre preamplifier.

A further letter from Gil on 8/4 gives an update on the Macquarie Island business. Apparently the *Icebird* dropped the people off on the island and then headed off to other Antarctic bases and then (hopefully) went back to Macquarie to unload cargo, which included the radio equipment. About the end of April was the expected recall time.

Sojo VK0SJ, has been in contact with Gwen VK3DYL. He has regular scheds on Mondays and Fridays on 7.095 MHz with VK7HK. After contact they QSY. On 20 metres they try 14.120 MHz. Time, about 0900 UTC.

OVERSEAS

Steve VK5AIM, has recently returned from a trip to New Zealand where, amongst other things, he enjoyed rides on jet boats, helicopter, light aircraft and a ski-lift! The other things were his 75 contacts on his two metre hand-held, and was able to access most repeaters in the cities he passed through.

Steve also keeps me informed of happenings in the UK via *The Short Wave Magazine* ano last month I was able to pass on some information about the relaxing of restrictions in the UK for use of the 50 MHz band (in fact, they seem to be even more liberal there than here in VK), but the Class B stations are understandably annoyed at not being able to use 50 MHz as some of those stations have been on the air for a long time. However, the DTI has invited the RSGB to re-open the topic of initial restrictions after a year, when the cumulative experience of operators will have revealed if there are really any interference problems.

The low power (100 W ERP) Belgian station in Antwerp with a vertical antenna is the nearest station to the UK and they are satisfied that, under normal propagation conditions, they are unlikely to suffer interference. With that in mind of course, we wish our UK brothers well and hope they enjoy six metres to the full.

Also from the same magazine I note that the annual two metre table has been included and G6XVV heads the list with 101 counties and 30 countries worked, although the second place-getter GW4TTU has 95 counties and 34 countries. Apparently counties count before countries over there! But 34 countries, even for a UK station is a very good tally. It would be interesting to know what the actual possible total of two metre countries would be.

The 70 cm annual table shows G6DER as having worked 70 counties and 22 countries, while on 23 cm he has worked 47 counties and 17 countries. What a difference our own geographical isolation makes when we attempt to work other areas on frequencies 70 cm and above, when compared with the opportunities obviously offered in Europe.

The Soviet satellites RS-9 and RS-10 are now complete and ready for launch any time. RS-10 incorporates a 15 metre up and two metre down transponder, which is unusual. Its 40 kHz bandwidth is indicated by beacons on 145.957 and 145.997 MHz.

THE NORTH WEST

Last month, I received my first copy of the newsletter of the *North West Radio Society*, which is edited by Dave VK6YA, at Wickham. In response to my request for further copies, the April issue duly arrived. Included in its pages is a list of newsletter recipients totalling 33, all located above the 26th parallel, plus one SWL and one rank outsider, VK5LP! I had no idea there were so many stations up there. Because of isolation, a lot of activity is on HF which is understandable, but the degree of VHF activity is considerable, especially with the availability of two metre repeaters.

Contacts have been made regularly between Karratha to Broome and Shay Gap by Jack VK6RJ and Grant VK6KE respectively, who have also received considerable assistance with ducting up and down the coast, accessing all repeaters down as far as Exmouth, this latter repeater was last heard in Perth on 27/3.

Ron VK9XJ is returning from Christmas Island but, before doing so, was making considerable effort to try and work to the mainland on six metres. At the VK end were VK6s KOJ; WV; AQ and YA. During all these attempts and while their beams were on Christmas Island, VK6YA worked three stations in Alice Springs with signals to S9 at 0300 on 31.3. In 1/4, Ron VK9XJ worked YC0AMC, in Indonesia at 1100 and S9.

Not content only with that contact, Ron VK9XJ kept firing signals to WA and finally, on 6/4 contact was established with Dave VK6YA at 0952. They used 10 metres as an indicator for band conditions, and persistent calls on six metres finally produced the desired result, with reports 5x1 exchanged both ways.

Andy VK6AQ, is looking to construct an SSB repeater, presumably on six metres, for use in the Port Hedland area.

EME NEWS

To say the least, news from the EME scene is very scarce. I note from *The Propagator* that Lyle VK2ALU has been touring New Zealand and one evening, whilst there *"they had the largest get-together of EME operators in the Southern Hemisphere"* with ZL2AQE, VK2ALU, ZL2AZQ (ex G4KNZ) and DK5AI, who operates two metres EME in Germany. He dropped in unannounced so fate must have been kind to such a gathering.

Lyle and his gang are still being plagued with security problems at their EME site; a further breaking and entering occurred recently but nothing was taken as they have been making a habit of recent times of taking the valuable equipment home again after a period of operating, bringing it back next time and setting it up. Needless to say, a most unsatisfactory way of working.

Although not known to a lot of people, I have, for some years been plodding along trying to complete a parabolic (dish) antenna for EME operations on 432 and 1296 MHz. Much of the constructional work has already been done on the parabola, with all 24 trusses being completed which, when assembled, would make a 32 foot (10m) dish.

About two years ago, I began to notice changes

in my walking gait and 14 months ago it became so serious that I was forced into a series of back operations which have been successful, but have left me with balance and walking problems; these would have been much worse except for extensive physiotherapy.

I am now forced into a situation of accepting that recovery can never be complete, and that the inability to lift heavy items and problems with balance particularly when on ladders or greater heights above ground (eg scaffolding, antenna masts, etc) must mean, more or less, permanent changes of life-style. I can do most things I used to, but the two problems mentioned earlier in this paragraph are very serious when it comes to completing a dish and climbing around its tower.

So, with much reluctance, I feel I must terminate the project and maybe do something else. It is a bitter pill to swallow, but then at other times I am thankful I am not in a wheel-chair, which was the alternative!

Accordingly, there must be someone out there who could afford to pay the much reduced price I am asking and be prepared to go on with the project and bring it to fruition, it would seem a pity for all the work so far done to have been wasted while the results of my labours languishes in a shed.

This is not a sales column, so I don't propose saying anything more other than to hope the project will continue in someone else's backyard, so that eventually I may be able to see what I started looked like when finished. Details in Hamads.

OTHER NEWS

The Mount Gambier Convention will be held this month so, once again, the friendly rivalry which exists between VK5 and VK3 will cause some hilarity. It is a good show and well worth keeping going as it presents one of the few opportunities for amateurs to get-together in the southern regions, particularly when often it has been possible for participants from both States to have worked one another on two metres or 70 cm.

You are reminded that Six Metres Standings updates are required on my desk by the 15th June for inclusion in the August issue.

The Ross Hull Memorial Contest will only be six months away by the time you read this. Despite all the on-air grumblings about the last Contest and my request for your ideas for the better running of the Contest, almost nothing in the way of ideas has appeared on my desk. What about something on changes to the scoring table which seemed to be the main bone of contention? I have a few ideas but would like to hear from some others too.

The photograph in this issue shows three well-known six metre operators, taken at the SMIRK Convention in 1983 by Graham VK8GB. Al KH6IAA has provided many a VK with his first KH6 contact, while Kazu JA1RJU has been a most successful operator with a great score of countries, whilst Clay WA4TNV/KL has been about the only contact available from Alaska on six metres that I know.

From Bill Tynan's *World Above 50 MHz* in *QST* for April comes the word that EI9D and some other Irish stations are receiving six metre permits, with much the same local restrictions as the UK amateurs mentioned by me last month. They have one further handicap in that they are only permitted operation outside of peak broadcasting hours. Operations with permits is also a variation from the Class A licenses of the UK.

Also from the same columns, OZ1PJJ, who is an active VHF operator in Denmark, is going to Greenland for two years and plans to work six and two metres from there. He plans to set up beacons on 50.045 and 144.902 MHz with the call sign OX3VHF. Might be fairly hard for us at the present state of the cycle, but stations in Canada and USA stand a chance of making contacts.

Bill also comments that during the big auroral opening of 8th February 1986, record-breaking DX on two metres was established, South America and Hawaii worked and a New England (USA) station was heard in Sweden on six metres! But we won't know all this good news until next month, but it certainly sounds interesting. And coming at a time so close on the heels of our own record-breaking two metre season last year. Very interesting indeed. But let us all be ready in VK for December 1986!

Tim Mills VK2ZTM, Beacon Co-ordinator, sent me a list of Australian beacons for comment, compiled from various sources including AMFAR. If the list is anywhere near accurate, and I suggest it isn't, then there are a lot of beacons operating, particularly on 70 cm, about which I know nothing! Call signs listed about which I am not aware of their status/operating schedule are VK1RBC, VK3RMB, VK3RTG, VK3RMV, VK4RTL, VK3RAI, VK6RTW, VK3RGG, VK4RAR, VK6RPB all on 70 cm; on two metres VK3RTG, VK3RMV, VK3RGG, VK3RCW; six metres VK3RGG, VK3RMV, VK1RCC; 50 cm VK6RPB; 23 cm VK1RBC, VK6RPB. As I give all operational beacons continuous publicity through my columns, I think State beacon co-ordinators should keep me informed of additions and changes promptly. If the present Amateur Radio listings are in error I ask to please be informed now so corrections can be made. If any of the call signs listed above are, in fact, in operation likewise, please inform me — there is nothing worse than an inaccurate beacon list. Please put pen to paper straight away.

By the time you read this I will have returned from several weeks touring with a caravan through Victoria and New South Wales. Whether I will have been able to make much contact with the amateur population will depend on a number of factors. I am taking enough *kept back* information for me to prepare these columns whilst away so next month may lack any real up-to-date information.

Closing with the thought for the month: *Those who burn the candle at both ends aren't always bright!* 73 The Voice in the Hills.

ar

Al KH6IAA, Kazu JA1RJU and Clay WA4TNV/KL at the SMIRK Convention USA in 1983. All are well-known six metre operators.

Photograph courtesy Graham Baker VK8GB

NEWS FROM LONDON

RSGB MORSE TESTS

Now responsible for administering the amateur radio Morse test, the RSGB has announced details of how it proposes to run the new service. In overall control will be a Morse Test Steering Committee, chaired by a Chief Examiner, appointed by the RSGB in consultation with the licensing authority, the DTI.

Six Regional Examiners will be responsible to the Chief Examiner for test standards, and Senior Examiners and Session Examiners will look after the practical details at each test centre, and conduct the actual tests.

About 200-250 examiners will be required to begin with, who need not be members of the RSGB. They must, however, have a recognised Morse qualification at 20 WPM or over, or pass a test, conducted by an authority agreed by the DTI, at this speed.

The form of the test will remain unchanged from that used over recent years, sending and receiving 36 words (average five letters per word) in plain language in three minutes, and 10 five-figure groups in one-and-a-half minutes. There must be no more than four errors in the letters, and two in the figures in either sending or receiving.

Previous tests were available at 22 centres, half of which were coastal radio stations, often requiring a long journey for candidates. The new arrangement, apart from reducing the fee from 15 pounds to seven pounds, will make tests available at more convenient times and locations.

The RSGB hopes to have at least half of the planned 74 test centres available within six months, and the majority in 12 months. Centres will hold six tests a year, and a strict timetable will ensure that candidates not wishing to wait two months for a test will find centres in neighbouring areas available in alternate months for earlier appointments.

Although the scheme was due to start on 1st April, the RSGB did not publish its explanatory booklet until 11th April, so no examiners were actually in post at the *off*. Special arrangements allowed tests to be administered at the National Amateur Radio Convention at Birmingham on 5-6th April, and these will continue at other exhibitions and rallies as an interim service, while the full scheme gets under way.

Contributed by AR's London Correspondent, Tony Smith G4FAI.

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QSP

VOICE MAIL BOXES

Digital technology has made it possible to store, retrieve and forward the human voice in a form called *voice messaging*.

Using a touch-tone telephone people can communicate via voice mail-boxes, send voice mail to multiple recipients, copy a message and send it to another person for action.

Businesses throughout the USA are using voice messaging and it has been introduced to Australia through AAP Reuters Communications.

On an average more than two-thirds of telephone calls fail to reach the desired party at the first attempt but voice messaging keeps the information flowing without the need for simultaneous conversations.

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

With the demise of Halley's Comet to future generations, one can settle down to some serious DXing even though we are at or near the bottom of the Solar Cycle.

There is still a lot of good DX around, admittedly sometimes one has to be lucky, but a call on a dead band can, at times, produce astounding results.

Recently, I was listening on a somewhat 'dead' 20 metre band and I heard a VK call CQ over a period of a several of minutes. That amateur was kept busy with some very interesting QSOs for a couple of hours.

Ladies and gentlemen, give the occasional CQ and I am sure you will be quite surprised with the results. If everyone listens and no one calls, the bands appear to be dead. This is proved when a contest is on. Sometimes it is difficult to find a clear space to call CQ without interfering with another station.

AT IT AGAIN

Frank DL7FT, has been at it again. Same country, same call and it appears that the Greek Society, combined with the authorities, are far from impressed.

The authorities still maintain that he has no approval to operate from Mount Athos, however it appears that Frank has notified the ARRL that he has permission from the monks, or at least some of the monks . . .

The big question is, has he got written permission and if so from how many of the hierarchy in this area and, most of all, is it enough to convince the ARRL DX Desk of being an authentic operation.

Early reports from overseas were that Frank was due to visit Visalia to explain his actions. General advice is that he should watch out for a 'lynching' party. However, later overseas reports said he was not going.

It would be advisable to hold cards on a wait and see basis.

LAOS

XW3LX has been worked giving his QSL Manager as N6OT. Unfortunately N6OT is not aware of the honour bestowed upon him and it appears it may be another hoax.

APRIL FOOL'S DAY

ZA1AZ was heard operating from parts unknown on 1st April. Unfortunately he was giving W3HNK as his QSL source. As I have said before, the hobby could do without these types.

FALKLAND ISLANDS

Barry VP8WTW, is active from the Falkland's until the end of this year. Barry is employed by Wimpey-Taylor-Woodrow, one of two construction companies employed in updating the airport. Hence the unusual suffix.

Barry's station consists of an FT-757GX with 100 watts into a three element triband beam at six metres. He hopes to be active now on both 40 and 60 metres,CW and SSB.

QSLs either direct to PO Box 2, MPA, Falkland Islands or via the bureau to G4ZCN, his home call.

Other amateurs active from the area are VPs 8LR ML, PTG (mainly CW) and WA.

CARDS

The ever-obliging Joe W3HNK, can get cards for those that are really desperate for the unusual USSR calls of EN4L, LY4L and UX4L. Joe is not the QSL Manager for these stations and they should be routed through the Box 88, Moscow Bureau from the respective WIA Bureaus.

WHERE IS HE?

Ken G3NBC, present QSL Manager for George VE3FXT, wishes for information on his whereabouts. He has received no logs but lots of cards which he cannot answer. Anyone hearing George could ascertain details of his whereabouts and advise him of Ken's predicament and also advising Ken would be appreciated.

ONE SIXTY METRES

Ron VK3BEE, a very keen enthusiast of this band, moved QTH to the wide open spaces at the beginning of the year. His new QTH is in the vicinity of Cockatoo, a delightful area in the Dandenong Ranges, east of Melbourne.

Ron's new QTH is plagued by 11 kV power lines. By careful selection of the symmetry of locating his low band dipole at 25 metres, he has alleviated the power line noise and has worked and heard a multitude of stations, working and listening on an irregular basis due to the chores of moving into a new home and of course having the hassle of working for a living.

Ron states, *"this year in particular, the Equinox season has been very good for stations on the east coast of Australia. Good regular openings and at times excellent conditions where signals into the USA, (particularly the east, central and west coast areas) have been S9 for up to two hours".*

Ron also reports that *"signals into Canada and Alaska regions with a consistent path into Japan, Eastern USSR and excellent signals into Europe have been experienced".*

What Ron has worked and heard this year up until the middle of April follows:

WORKED CW-AM:	DJ6WL, IT9ZGY, KX6DS, P29PR, RA3DOX and UA9AJX.
PM:	JA0CAK, JA1CGM, JA2XW, JA7TQK, JA9YBA, KH6AT, KL7Y, N1ACH, P29PR, UA0KBW, UZ0CWO, VS6DO, W1CF and W7TB.
WORKED SSB-AM:	P29PR.
PM:	N6TR/7, NK7U, P29PR, UZ0CWO, W0ZV, W0KEA and W7OEV.
HEARD CW-AM:	4X4NJ, DL9KR, G3BDQ, G3SZA, HB9BCI, KH6CC, LZ2CJ, RA3LBW, RF6QAI, RT4UA, SM6CPY, UB5ISG, UD6DC and XX9CW.
PM:	H44IA and VE3BV.
HEARD SSB-AM:	HB9ABQ, LZ1KOZ, UD5SDE and YU1AAO.
PM:	VE7BS.

Ron mentions that many more stations were heard in the mornings, some as late as one hour after sunrise, but they have not been noted.

Thanks Ron, for your contribution, good luck in settling in to the new abode and we hope to hear more from you when you raise the dipole to 35 metres and erect the pair of 30 metre verticals.

FO0XX ACTIVE AGAIN

Whilst writing these notes, a note from Kip W6SZN, arrived advising that the licence, landing permission and other formalities had been obtained for a five operator, five or six day operation onslaught from Clipperton beginning on the second of last month.

The operation is again under the banner of the Clipperton DX Club with the operators being AI6V, N7NG, W6OAT, W6RGG and W6SZN. Two stations were scheduled to be operating both modes 24 hours per day and particularly looking for those that missed out last time including the areas of Europe, USSR, Middle East and Africa.

Good luck to those that acquired it for a new country and it is to be hoped that the 'egoistical' operators that have it under their belt gave the newcomers to the DX bands a go.

SUDAN

ON7IT/ST, will be active from Sudan until the end of next month. QSL to the home QTH or via your bureau.

PIRATED CALL-SIGNS

Unfortunately, this is becoming a regular segment of the column. Anyone who worked 5U7AC after 1969, worked a 'pirate'. The call was held by Yves Anatole F9GY and has not been reissued although it has been known to be have been used, but not of late.

The call signs of Paul F8HH and his wife's allocations of TT8AK, 5U7AW, 5R8AK and 6W8AW are currently being pirated.

Another pirated call sign is 3A0GB. The call was legitimately used by W2GBX in 1971. Since 1978 no 3A0 licenses have been issued to visitors.

SAO TOME

Luis S92LB, (on my much wanted list) is still quite active and is apparently working most parts of the world excluding the Pacific, due to conditions. He is still appearing around 14.183 MHz at 2130 UTC and by all reports working into Europe and particularly the USA. QSL to his home QTH, he has no manager.

EXPLANATION

Did you work XEFJTW recently? Well, he was a legitimate call sign and here is the story as printed by Bob W5KNE, Editor of QRZ DX.

"During the CO WPX Phone Contest there were several reports of a station signing XEFJTW/XE0, a call sign that was a bit unusual; some thought it was a phoney. AA5B, the operator of XEFJTW, tells the story:

'The call XEFJTW (yes, it is strange) was assigned to me by the Mexican government for my use while visiting the country until mid-1986. QSLs should go to my home address. The government has just recently established formal procedures for obtaining temporary radio permits and with any luck, call sign assignments will improve.

'I operated from El Sauz during the WPX Phone Contest using just a TS930 and an 80 metre dipole up at eight metres and made 520 QSOs on 80, 40 and 20 metres. At least 450 of the people I contacted asked for two repeats of the call, 200 wanted a detailed explanation, 100 accused me of being a pirate, and 50 refused to log the QSO (their loss, since I was the only XE0 on during the contest).

'Intentional jamming occurred but was infrequent. After 10 hours, I called it quits and drove home (a 950 kilometre drive) to be with my family for Easter'."

An interesting story and it pays to log all calls one receives. One never knows when it could be a good one.

SIXTY YEARS

The Dominican Republic are celebrating 60 years of the hobby by using the special call HI60RCD until the end of the year. For both modes QSL to PO Box 1157, Santo Dominica, Dominican Republic.

INDIAN OCEAN EXPEDITION

Joe WA6VNR, is still looking for amateurs and their wives to join him and his wife on a DX tour of the Indian Ocean. Only adventurers need apply to Joe at his Call Book QTH.

Whilst on the subject of the Indian Ocean it is hoped that the Indian authorities, with the assistance of their Prime Minister Rajiv VU2RG, can activate the Andamans, as it is a much needed country and is climbing high on the wanted list. Maybe Joe, if he gets his party together may be allowed to operate from there or the Indian Society maybe able to launch their own onslaught to assist the DXers. It would create excellent international relations with all countries and would have the backing of the major DX Foundations.

See the Contest Column, this issue, for the positive steps Ian VK5QX, has made in an attempt to get Andaman and Nicobar on the air. This is an approach from a different angle — let's hope that it may bring some results!

WARC BANDS

Fred VK4RF, reports that he has notched up 80 countries on 10.1 MHz running 85 watts into a dipole at nine metres.

Some of the more interesting countries Fred has contacted on this band are: *4Z4, 5B4, 8Q7, 9HI, 9Y4, C30, CT2, CX, EA6/8 and 9, EI, FG, FM, GJ, GU, GB0, HC/8, IS0, J28, KP4, OA, PJ, SV, TI2, TK6, T30, VP2A, VP2M, VP9, VS6, YV, ZC4, ZL7 and 8 and ZS6.*

Congratulations Fred on a sterling effort and it shows that low power and persistence will get through.

TURKISH AMATEURS

The Turkiye Radyo Amatorleri Cemiyeti known as TRAC have forwarded a list of official Turkish Amateurs as at 31/10/1985 and claim that all others are pirates. (Please allow for updating before condemning any amateur).

OFFICIAL CALL	LOCATION	EX CALL	NAME
TA1A	*Istanbul*	TA1UA	Unal
TA1B	*Istanbul*	TA1SU	Salim
TA1C	*Istanbul*	TA1ZB	Metin
TA1D	*Istanbul*	TA1MB	Kadri
TA1E	*Istanbul*	TA1AS	Aziz
TA1F	*Istanbul*	TA1NAG	Tuncer
TA1G	*Istanbul*	TA1KD	Kadri
TA1H	*Istanbul*	—	Hasmet
TA1I	*Istanbul*	TA1ES	Emre
TA2A	*Ankara*	—	Cemal
TA2B	*Ankara*	—	Fethi
TA2C	*Ankara*	—	Teaman
TA2D	*E.Eregli*	TA2AK	Ahmet
TA2G	*Ankara*	—	Suha
TA2J	*Gebze-Ist*	TA2FM	Fazil
TA2I	*Ankara*	—	Rasim
TA2L	*Ankara*	—	Erdogan
TA3B	*Izmir*	—	Mustafa
TA3E	*Izmir*	—	Ergun

Cards for these amateurs will be sent and accepted by the TRAC Bureau.

ETHIOPIA

Correspondence between between Franz DJ9ZB, and Tensay ET3PS, has resulted in Tensay using the Club call ET3PG, as ET3PS is not yet acceptable to the ARRL DXCC Desk. It appears that Tensay is quite unrestricted and has no limitations on using the club call.

ANGOLA

Gerson PY1APS, is employed by a company building a power plant in Angola. Gerson had occasion to visit the site and applied to obtain operating permission directly and through his Embassy. The reply was no and the official letter from the Angolan Ministry of Transport and Communications included the wording *'...Amateur Radio operation is not permitted in the Angolan territory.'*

Question? *Where does that leave D2BCW and are his contacts legal?*

NOT QSL MANAGER

Dave VK3ADD, is not the Manager for Trevor VK0TB, who operated from the Antarctica in 1977. Trevor's QTH is 69 Alma Street, Chadstone, Vic. 3148.

Also Maryanne WA3HUP, is not the QSL Manager for either 3A2CQ or 3A2CZ.

GENUINE ACTIVITY?

Yoshi JA1UT, was due to visit Laos last month. *Can we expect to hear a genuine XW on the air shortly?* Yoshi was the instigator of getting XU1SS on the air after a visit in 1983.

NEW BY STATION

A new BY station will be activated from Suzhou in the Jiangsu Province. JA9AG and eight other JA operators will attend the opening ceremony from 6th to 12th of this month. For the initial opening QSL to JA9AG. The prefix will be BY4 and the suffix is unknown.

BITS AND PIECES

Chile is using the new 3G prefix. * * B5QA quite active from BY-land. * * Two HS club stations were active during the WPX Contest. * * The H5AY operation was assisted by ZS4s DC, JB, KK, MG and NS. QSL to ZS4NS. * * VQ3CE purported to be signing out of Tanzania. Quite doubtful as the VQ prefix is assigned to Great Britain. * * Watch for Rag JW7FD, who will be active from Bear Island until the end of the year. * * As from 1st February the JT0 prefix is not available to visitors. Instead they will use their home call /JT. * * UD6KZ, heard on 20 metres SSB, is in Oblast 003. A rare one! * * It appears Baldur DL0MAR/9G and his XYL have gone QRT. *Where will they appear from next?* * * HF0POL is again active and it is expected he will be QRV at least until the end of the year. */* At least one of G3KQL/TT8 cards has not been accepted by the ARRL DXCC. Reason — insufficient documentation. * * Lloyd and Iris Colvin's trip through Southern Africa netted in excess of 50,000 contacts. Quite an effort in view of some of the problems they faced. * * The operation signing . . ./IA5 was from Monte Cristo Island. * * FT8YA is active from Adelie Land. * * The OZ 160 metre allocation is from 1.830 to 1.850 MHz, mode CW and 10 watts of power. * * ZA2AOP may be the call if the OK operation gets off the ground in September. (September is a long way off . . . VK3AH).

HEARD AND WORKED ON THE EAST COAST

10 METRES
JA7DLE* and UA0ALK*.
15 METRES
G0CMV/M*
20 METRES
9H1EU, 9J2LC, AH2BE, DL2ZAD/KH8, HK3SY*, HK9BRW*, JW0A*, JY5IH, KG4TR, UV1OO/FJ*, ZC4MR, ZK3RW*, ZS3GB and ZS3JS.
40 METRES
CU2CH, CX9AU, EA4KR, EA4BVE, EA4CDZ, EA5AD, EA58W, EA5FHE, F8ARC, F6BMV, F6DZU, F6FEF, F6FGY/TK, G2BJK, G2DMR, G4AMT, G4FAM, G4FIV, G4LVO, G4NSD, HB9RG, I1TBE, I5GJK, I5ICY, I5IGQ, I5YBZ, I6VYV, I8IGS, IK6CNT, IX1BGJ, J73LC, LU3ABX, LU9FFA, ON4TY, ON4AAC, PY1YD, SP2GE/MM, VY1CW, XE1EGF, XL7SV, YS1RRD and ZL7AA.
**Denotes CW operation.*

QSL VIA

3C1MB:EA7KF; 3G3DX:CE3ESS; 3D2JA:JJ1TZK; 3X0HSH:DK8PR; 4N7ZZ:YU7FIG; 5B4LF:KA3FIB; 5B4MF:IK8DYD; 5H3HM:VE5VJ; 5H3ZO:K0LST; 5R8AL:WA4VDE; 5W1CW:ZL1AMO; 5W1FJ:JJ1TZK; 5W1FP:ZL1BQD; 5Z4EO:DJ5RT; 8P6AR:N6AUV; 8P6GG:N4CTC; 9J2LC:YASME; 9X5DH:DK8EA; A35EA:ZL1AMO; A35ZK:JJ1TZK; C21NI (Feb/March):JJ1TZK; JW0A:SP2HMT; CT1BOH:W3HNK; CW8AC:CX2CS; OL3NAZ/CP8:CP8AL; EL2AY:N5GAP; EL2EF:KM8E; F6DCL/TL8:F6KGI; FO8BI:F8HSI; FO8FO:F2BS; FV6NDX:F6AJA; FV8PAX:F8BO; HK0BKX:HB9NUL; HU0X:YS1RRD; HV3SJ:I0DUD; IK4CXL/IA5:I5NQZ; J39BS:WB2LCH; JA1ZLO/JD1:JM1LPN; JR4ZQH/4S7:JR4ZQH; JW0A:SP2HMT; JY9RL:WA6POZ; KD2HE/VP9:KD2HE; KX8DS:N4NO; PJ0B:K3EST; PQ8ZZ:PY4AG; SM7CRW:W3HNK; T21TA:N4FUL; T21ZK:JJ1TZK; T30AC:AA6BB; TE1W:TI2KD; TR8SA:F8FNU; UV1OO/FJ:UA9LBR; V47K:WB0MIV; V47M:NI0E; VK0SJ:VK7RM; VQ9QM:W4QM; XEFJTW:AA5B; XQ1ADG:CE1ADG; XX9CW:DK7PE; YT2AA:YU2SEV; ZK1XR:JJ1TZK; ZK1XU:W7TB; ZK3RR:ZL1BQD; ZK3RW:ZL1AMO; ZS6BCR/Z2:ZS8BCR.

QTHs YOU MAY NEED

8Z4BP	PO Box 73029, Nairobi, Kenya.
9L1IS	PO Box 1289, Freetown, Sierra Leone.
BY5RA	PO Box 730, Fuzhou, Peoples Republic of China.
FG5BM	PO Box 1249, Point-a-Pitre, Guadelope, French West Indies.
FR4DN	Philippe Mondon, CD16, 97425 Avirons, Reunion Island.
H44IA	PO Box 219, Honiara.
HK9BRW	PO Box 86, Leticia, Amazonas, Bolivia.
J28EG	PO Box 2417, Djibouti, Republic of Djibouti.
J73LJ	PO Box 245, Roseau, Dominica, Windward Islands.
JY8XY	Robert Johnson, RT 1, PO Box 173, Endeavor, WI 53930, USA.
KG4TR	PO Box 41, NSGA, FN PO, New York, 09593, USA.
V3GJ	PO Box 286, Belize City, Belize, Central America.
V85AK	PO Box 2623, BSB, Brunei.
VP8VK	G4RFV, 38 Waterloo Road, Darbys Corner, Poole, England.
ZK1RE	PO Box 47, Raratonga, Cook Islands.
Z83JB	PO Box 1165, Tsumeb, 9000, Namibia.
ZS3JS	PO Box 1185, Tsumeb, 9000, Namibia.

THANKS

Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-QSO, DX FAMILY FOUNDATION NEWSLETTER, INSIDE DX, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, NEWSLETTER OF THE VIENNA INTERNATIONAL RADIO CLUB, QRZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, ccDX, JA CO, JARL NEWS, KARL NEWS, OST, RADCOM, VERON and WORLDRADIO.

Members who have contributed include VKs 2PS, EBX, 3YL, ADD, BEE, DYL, 4RF, 5QX, AKH and G3NBC. Other contributors include the Turkiye Radyo Amatorleri Cemiyeti, Westlakes Amateur Radio Club, W6SZN and ZLs 1AMM and AMN. Thanks to one and all who have made this column possible.

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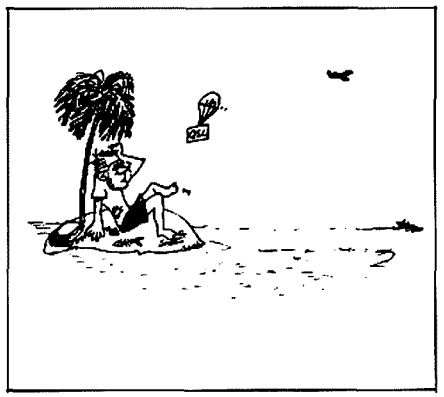
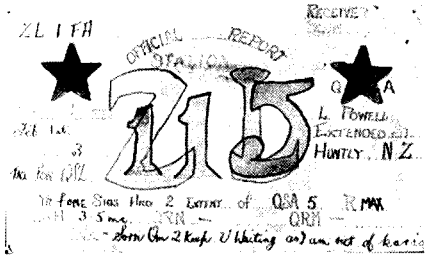
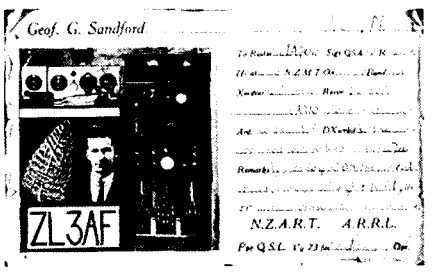
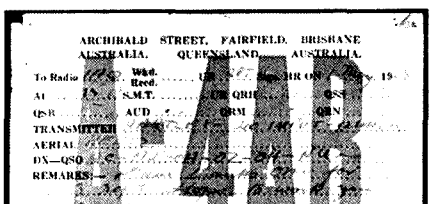


From ZERO BEAT — March 1985







The above QSL Cards are from the Antique Department and are presented courtesy of Peter VK3KAU.

Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Recently, I obtained a subscription to the International Listening Guide. This is a basic directory of international broadcasting, being published four times a year to coincide with the propagational alterations. I must state that I have found it invaluable, especially in the identification of broadcasters. *How is this possible?* Well, the survey is divided into two sections: the first being a summary of English language broadcasts from the External Services, while the second section is a World Frequency Survey.

As I am writing this, we are at the height of the Libyan Crisis. By using this publication, I have been able to follow subsequent developments. For example, by looking up the entries in the first section, I was able to find what broadcasters were having a newscast at that particular hour. Once I have found the station I require, it is easy to use the second section to ascertain what frequencies are being utilised, particularly to this region. Say at 0400 UTC, we see that the *Voice of Turkey* is having an English newscast on 9.560 and 9.730 MHz. The first channel is clear, but there is another station on 9.730. By looking up that channel in the World Frequency Survey, we see that *Radio Havana* is broadcasting in Spanish. It also tells me that Ankara is broadcasting on that channel to Asia.

JAMMERS ARE ALWAYS THERE

As one scans across the broadcasting allocations, frequently jammers are heard, with their distinctive CW identification. On 9.520 MHz, the jammers are seemingly ever-present, making it impossible to identify who is being jammed. The survey tells me that it is Radio Liberty, the US backed clandestine station in Russia. The service is almost continuous, explaining why the jammers are always there. The survey also gives the transmitter sites and what operational hours they use. The West German sites are almost exclusively used on 9.520 MHz, yet between 1900 and 2100 UTC, RL uses their Spanish site.

The International Listening Guide is compiled and published in West Germany by Bernd Friedwald. These are put together after the commencement of each broadcasting period, compiled from monitor's observations and the survey is then mailed out in a fortnight to three weeks of the commencement. The SWL/DXer than has, at their fingertips, up-to-date information. Each copy costs $A6, yet a subscription for the whole year costs $A20.

SURVEYS

Personally, I have found it superior to the *World Radio TV Handbook*, as far as up-to-date, accurate schedule information. The handbook has a plus in that it contains information on the smaller broadcasters, servicing domestic audiences which is not generally contained in the ILG surveys. However I mainly now rely on the ILG observations, supplemented by monthly DX loggings from the Southern Cross DX Club and Australian Radio DX Club.

Looking at the surveys, I am somewhat amazed to find that a channel will sometimes have two broadcasters, targeting the same area, with the same language at identical times. On 11.810 MHz, we find that Bucharest and Radio Korea are both beamed to South America in Spanish. This is at 2400 UTC. There are other instances that are easily heard, and one has to listen carefully before being able to correctly identify the station. It must make it difficult for listeners within these target areas. On the whole, there is co-operation between the various broadcasting organisations, yet this occasionally does not happen. This happens where the countries often don't afford diplomatic recognition of each other.

If your are interested in the *International Listening Guide*, the address to write to is: DX Listeners Service, Merianstrasse 2, D3588 Homberg, Federal Republic of Germany, or to their Australian representative — Howard R Moore, 33 Brooklyn Avenue, Salisbury, SA. 5108.

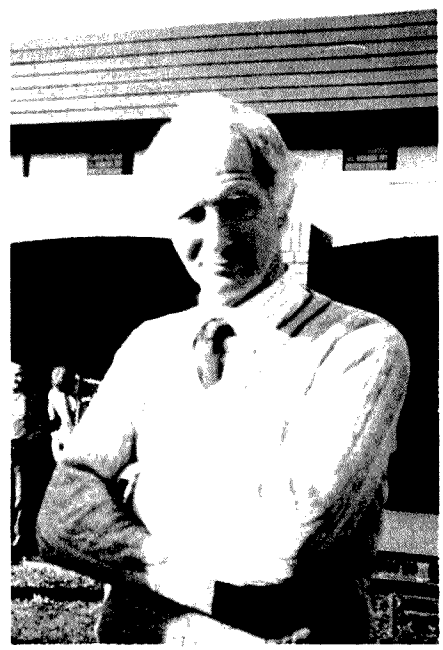
OFF THE AIR

And talking of changes, there was an outcry recently after the BBC World Service announced that it was terminating the popular program — *Letterbox*. It was scheduled to be aired for the last time at the end of April. This program was a forum for World Service listeners to air their views regarding the output from Bush House — the home of the BBC External Services. At the deadline time (mid-April), the BBC has not so far announced any change of heart, although they indicated that they may review a replacement program in future. In mid-March, *Monitor* was also taken off. This was a summary of what the various electronic media were saying on current events. So it does appear that there is a new broom sweeping Bush House.

Incidentally, there has been a re-timing of one of the releases of *Waveguide*, a program that is to assist the listener to hear the BBC World Service. It has been re-scheduled from 0430 UTC Wednesdays to 0445 Mondays. The other releases at 0750 Sundays and 1115 Tuesdays are unaffected. The *DX-Partyline* on Radio HCJB recently celebrated its 25th Anniversary, on the 19th May. You can hear it at 0930 UTC Mondays and Saturdays and at 0700 UTC on Wednesdays.

SIGNALS NOTED

Around mid-winter, it is possible to hear stations on the 41 and 49 metre bands around 0200 UTC, which corresponds to my local midday, in Tasmania. Signals from Europe are coming in across, or close to Antarctica. I realise that SWL/DXers in VK4 and VK8 cannot hear this unusual propagation mode, because they are too far north, although I have been reliably informed that they have been heard on the Gold Coast. When I was in Brisbane about three years ago, it was evident to me that these signals were absent, although I was observing them in Tasmania. Signals from Asia were noted, which were absent down here, yet that isn't really surprising, considering the location of Brisbane.



DX CONVENTION

The Australian Radio DX Club will be holding a DX Convention on 7th to 9th June, at the Rawson Holiday Resort, in Gippsland. This is about two hours drive from Melbourne, in the foothills of the Great Dividing Range. I believe that there will be ample opportunity to do some DXing as there are no powerlines or interference, an ideal location. Besides that, I believe as well, that there are to be scenic trips arranged to nearby historic towns, such as Walhala. We wish all participants a good weekend, with plenty of DX catches.

The accompanying photograph this month is of Don Rhodes VK3BMB, of Yarra Glen, Victoria. I met him at last year's Convention. Don is originally from Leeds, York. He is a monitor for *Deutche Welle* the German External Service. We chat occasionally on 80 metres, swapping our observations.

Well, that is all for this month. All the best of winter listening and good DX. — Robin VK7RH.

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VE3SR LOSES COURT BATTLE

The judge hearing the suit brought against Jack Ravenscroft VE3SR, seeking damages for interference to a neighbours electrical appliances from his amateur radio operations, has decided the case in favour of the neighbour bringing the suit. (See earlier report, AR April. p8).

The judge granted a permanent injunction prohibiting VE3SR from transmitting radio signals from his property and assessed damages and costs amounting to Can$2558. The judge said that while Jack had a legislative right to use his equipment because he was licensed by the Canadian DOC, if he should interfere with the enjoyment of his neighbours electronic equipment then he is liable to a civil suit for nuisance. The unexpected outcome of the suit is a severe blow to the amateurs of Canada, and poses a threat to the operators of any licenced radio transmitters in that country.

VE3SR was given 10 days in which to appeal against the decision.

From The ARRL Letter, 11th April 1986

AMATEURS HELP HOMELESS AND HUNGARY

Amateur radio was selected to provide communications for *Hands Across America*, on 26th May 1986. It was anticipated that 6 000 000 Americans would join hands in a line stretching over 4000 miles from New York City to Los Angeles. A group of people, which sponsored the US Aid for Africa last year, and co-sponsored by Bill Cosby, Kenny Rogers, Pete Rose and Lilly Tomlin, designed this benefit to aid the homeless and hungary in America. The National Communications co-ordinator was Charlie Kosman WB2NQV.

In 1984, Charlie organised communications for the well-known Olympic Torch Run across America, which last 82 days in the longest running net assembled for a special event.

For Hands Across America, Charlie needed amateur operators every mile of the 4100 mile link, as well as 210 command posts — between 4300 and 4500 amateurs equipped with VHF and/or UHF portable equipment. Each participating amateur was expected to be available for about six hours.

From The ARRL Letter

SILENT KEY

It is sad to report the passing of Nick Percival 9Y4NP, President of the Trinidad and Tobago Amateur Radio Society and an active supporter of the IARU.

During preparations for WARC 79, Nick persuaded the Telecom Administration in Trinidad to fully support the IARU position, and in so doing, guaranteed that the IARU original position was actually included as a proposal from a member of the ITU. Nick's efforts, coupled with those of amateurs in other countries, meant that at WARC 79, amateurs not only retained their allocations, but also obtained new ones.

Many Australian amateurs would be familiar with Nick on the HF bands, and he was a guest at the WIA 75th Anniversary Dinner last November.

From The ARRL Letter

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

JUNE
14-15 *All Asian Phone Contest (Rules this issue)*
21-22 *1985 VK Novice Contest (Rules May issue)*
28-29 *ARRL Field Day Contest*

JULY
5- 6 *Venezuelan SSB Contest*
12-13 *IARU Radiosport*
19-20 *Colombian Independence Contest 1986 (Rules July issue)*
26-27 *County Hunters CW Contest (Rules May issue)*
26-27 *Armadillo Run CW (See May issue)*

AUGUST
9-10 *European CW Contest*
16-17 *Remembrance Day Contest*
23-24 *All Asian CW Contest (Rules this issue)*

SEPTEMBER
13-14 *European Phone Contest*

OCTOBER
4- 5 *IRSA World Championship*
25-26 *CQ WW DX Phone Contest*

NOVEMBER
- 8 *Australian Ladies Amateur Radio Association Contest*
8- 9 *European RTTY Contest*
29-30 *CQ WW DX CW Contest*

VK NOVICE CONTEST

I point out specifically the VK Novice Contest for this year, that as this is the first time it has been held in June and should provide somewhat better conditions on the 80 metre band. I hope that many more entrants in this contest will result from this change in date. I would also hope that there will be many more novice operators using their skills at CW during this contest.

As written up in a recent issue of this magazine there has been quite some criticism of novice operators on this score. Remember that the speed for CW is limited under the rules to a *maximum of 10 WPM*. This does not mean that you have to operate at that speed, so even if you are pretty slow give it a try. I know you will be surprised at just how quickly your speed comes up after even just 30 minutes or so of operating. Remember that this is a contest primarily for novice operators and that this being so, all in the contest will be prepared to help you as much as possible. Remember also, you cannot hope to win the trophy unless you enter both a phone and CW log.

As I write these notes, the HF bands seem to be looking up, propagation wise, so I hope that this trend continues thus allowing you much more fun in both your contesting and general operations. There is certainly some merit, where DX is concerned, in operating during contests as you can often run across that choice one which you have been looking for.

By the time these notes are printed, the 1986 Annual Federal Convention will have been held and I trust that, as a result, you will have been able to learn some more about ideas which, as Federal Contest Manager, I would like to see implemented. My report this year covers quite a few items. Amongst them are included: A set of *guidelines for certificate issuance, Remembrance Day Contest*. (I would like these to be extended generally to cover other contests as well). The reason for this item is an attempt to make certificates of more value to the recipients. Detailed rules for the *HF Contest Championship*. Amendments to the *Federal Contest Manager's Terms of Reference*. A request that further improvement of the Remembrance Day Contest scoring system be considered. That the matter of certificates and trophies for non-members be determined. That whether or not the Ross Hull Contest should be continued, be dealt with at the 1987 Federal Convention, thus allowing entries for the next Ross Hull Contest to be taken into account. That *two* trophies be provided for Contest Championship purposes, namely one for Phone and one for CW. I have also requested that the Federal Executive approach various commercial organisations with a view to the sponsoring of trophies for winners of various sections of contests.

So it will be most interesting to see just what does happen to these various items at the Convention. I have also asked that the material provided by me be made widely available to members through the magazine, divisional broadcasts and meetings, etc. If you have an interest in any of these items, why not ask either your Federal Councillor or Divisional Council for more information as they have been supplied with complete copies of all the information I have submitted.

You will note from the Contest Calendar above that I have included the date for the ALARA Contest, 1986. I have been asked by Marlene VK2KFQ, who is the ALARA Contest Manager, to provide as much publicity as possible regarding this contest. So whilst providing this advance notice I would suggest that the best way of publicising the contest is for all ALARA members to tell everyone they contact all about the contest. I will be providing a copy of the rules nearer to the contest, probably in the October issue, however I can only ask that the rules be printed once as space in the magazine is at a premium.

I can tell you at this stage that the contest features both phone and CW operation and runs for 24 hours of the UTC day of 8th November. It would seem to be an ideal way of making a lot of YL contacts towards some of those YL awards which are available. As FCM I could not afford to ignore any requests from the YL organisation as I am well aware of the old saying about the fury of a woman scorned. I am most supportive of those ladies, who do so much to assist us mere OMs, particularly when it comes to such things as social functions, providing food for us on field days, etc.

Harking back to further details of the ALARA Contest, I must also mention of the *Mrs Florence McKenzie CW Trophy* which will be awarded to the Australian YL novice operator with the highest CW score. So there is certainly something for those concerned to think about. The winner need not necessarily be a member of ALARA either.

On another note, I wanted to add a personal side to this issue of the column. My parents-in-law normally reside in the UK. It happens that at this time they are visiting here with us, this being their first trip to Australia. It is also exciting for them to be able to meet their great-grandchildren for the first time and even more so is the fact that while they are here, they will be celebrating their Golden Wedding Anniversary. It was thus most interesting for me to be able to organise a QSO with a G-station, G4WMP who always has a most outstanding signal, and have them receive congratulations over the radio direct from England. It is possible to have amateur radio fit in with family life despite the fact that sometimes people might doubt that it can be done.

Once again, winter will be upon us and I hope that all the outside work needed to make antenna systems safe and water-proof, etc has been done. I also trust that while the weather might keep you inside for a while, you will be able to enjoy the contests which come up as well as your other general operating. You will probably will also be able to find some time to plan more for even bigger and better antennas and more extensive contest operations in the coming year.

During a recent visit to the United States, I had the pleasure of meeting a most charming gentleman by the name of Doctor Charan Singh, whilst on a flight from San Francisco to Los Angeles. Doctor Singh was appointed Regent of Jammu and Kashmir by his father, Maharajah Hari Singh, on the intervention of Prime Minister Pandit Jawaharlal Nehru. He was then only 18-years of age. Thereafter, from 1949, he was continuously Head of the State for 18 years — as Regent, as elected Sadar-i-Riyasat and as Governor. His was a unique instance of the last representative of the old order becoming, by the will of the people, the first representative of the new. During these years he was strikingly successful in fulfilling the delicate and onerous duties that devolved upon him as head of one of the crucial States of the Union.

In March 1967, soon after India's fourth General Elections, Doctor Karan Singh was inducted as a member of the Union Cabinet headed by Prime Minister, Indira Ghandi. At 36-years, he was the youngest person ever to become a Central Cabinet Minister. On this appointment he resigned his governorship and stood for election to the Lok Sabha from the Udhampur Parliamentary Constituency in Jammu and Kashmir on behalf of the Indian National Congress. He was elected to Parliament with an overwhelming majority and was re-elected from the same constituency in 1971, 1977 and 1980, thus proving his hold over the hearts of the people, despite drastically shifting political results on the national scene. He was first assigned the portfolio of Tourism and Civil Aviation, which he held for six years. In 1973, he moved to the crucial portfolio of Health and Family Planning and in 1979 assumed the portfolio of Education and Culture in the caretaker government. During his tenures as Minister, Doctor Karan Singh neither drew any salary, nor lived in government accommodation.

When the issue of abolition of princely purses and privileges came before Parliament, Doctor Karan Singh was the only former ruler to voluntarily surrender his privy purse and to put the entire sum into the Hari-Tara Charitable Trust, named after his parents, in the service of the people of India. He has converted his former palace in Jammu, known as Amar Mahal, into a museum and library, which was dedicated to the nation by the Prime Minister in 1975. This institute has a priceless collection of Pahari paintings and also Doctor Singh's personal library of about 20 000 volumes, built up by him over the last 30 years. He also looks after a number of other trusts which administer over 100 shrines and temples.

Doctor Singh has excelled in the academic field and in 1957 passed the MA examination of the Delhi University with a First Class First in Political Science, creating a University record which is still unbroken. He then earned his Doctorate by writing a thesis on the Political Thought of Sri Aurobindo for the Delhi University.

He acts as Chairman or Secretary of many other cultural and academic institutions. He holds the rank of Major-General in the Indian Army. He is an author of many books, a poet and musician, and speaks fluently in English, Hindu, Urdu, Punjabi, and Dogri. He is married to Yasho Rajya Lakshmi, grand-daughter of the last Rana Prime Minister of Nepal, Maharajah Mohun Shumsher. They have three children, a married daughter, and two sons who are at college.

Well, you might ask. *What has this to do with amateur radio?*

Apart from the fact that Doctor Singh proved to be a most enjoyable, as well as charming and extremely intelligent travelling companion, he is a man with an excellent grasp of what the modern world is about. During our conversation, the subject of amateur radio came up and he certainly was easily able to grasp all that I told him as well as being obviously interested in what it was all about. After arrival in Los Angeles, I contacted my friend Jack W6ISQ, who was the President of the Northern Californian DX Foundation who readily agreed that I should approach Doctor Singh and through his good graces see whether there was a way in which some operation might be able to take place from Andaman and Nicobar Islands. Jack assured me that the NCDXF would be willing to help in any way in sponsoring any possible expedition.

This I have done, and now I have passed copies of the correspondence to our DX Editor, Ken VK3AH, so that he may be able to tell the story in his column. I have related the above material for general interest purposes. It is quite amazing just what interesting people you can meet whilst travelling, though. Doctor Singh did seem interested to the extent that he thought he might like to take out an amateur radio licence. I certainly hope he does and I for one would be thrilled to be able to speak to him again and see just how much he could enjoy the friendly world-wide brotherhood of our hobby. I might just add that I consider myself very fortunate as I was able to enjoy his company for almost two hours. The aircraft was detained from departure and, having boarded, I found myself seated next to him after having been speaking with him in the boarding lounge. So it certainly is an ill wind that blows no good. An experience which I would not wish to have missed. Doctor Karan Singh was travelling in the USA on a lecture tour during which he was speaking on the subject of Indian politics, in which he is of course he is extremely well-versed. Just before we parted I asked him what he would say if he had any message to give to people in Australia. His answer was *Remember, India is much closer to Australia than Europe.* He felt that our two countries did have a good relationship, however he also thought that we could do more to strengthen our relationships.

Surely our hobby of amateur radio can do much towards this end. I wonder now that you know about Doctor Karan Singh if you might learn more through asking your contacts in VU-land about him. Doctor Singh has visited Australia and told me that he found Australia very interesting and enjoyable. The historical information regarding him was taken from a small biographical pamphlet which he kindly gave to me before we parted company in Los Angeles.

So that finalises my notes for this month. I wonder also whether or not you did experience any forms of unusual or enhanced propagation caused by the passing of Halley's Comet while you were operating on any of the bands?

(I believe that it has been blamed for many other effects with the weather, both hot and cold, being no exception. I recently also heard that another reason for unusual weather conditions was the proliferation of all those computers!).

73 from Ian VK5QX

27th ALL ASIAN DX CONTEST

The purpose of this contest is to enhance the activity of radio amateurs in Asia and to establish as many contacts as possible during the contest periods between Asian and non-Asian stations. It is supported by the Ministry of Posts and Telecommunication of Japan.

Contest Period:

Phone — 48 hours from 0000 UTC 21st June 1986 to 2400 UTC 22nd June 1986.

CW — 48 hours from 0000 UTC 23rd August 1986 to 2400 UTC 24th August 1986.

Bands: Amateur bands under 30 MHz.

Entry Classification:

1 Single operator, 1.9 MHz band (CW-only).

2 Single operator, 3.5 MHz band (including 3.8 MHz band, and so forth on).

3 Single operator, 7 MHz band.

4 Single operator, 14 MHz band.

5 Single operator, 21 MHz band.

6 Single operator, 28 MHz band.

7 Single operator, Multi-band.

8 Multi-operator, Multi-band.

Power, Type of Emission and Frequencies: Within the limits of own station licence.

Contest Call: Phone . . . CQ Asia. CW . . . CQ AA.

Exchange:

For OM stations — RS(T) report plus two figures denoting operator's age.

For YL stations — RS(T) report plus two figures 00

Restriction on the Contest:

No contact on cross-band.

For participants of single operator's entry — transmitting two signals or more at the same time, including cases of different bands is not permitted.

For participants of multi-operator's entry — transmitting two signals or more at the same time within the same band, except in case of different bands, is not permitted.

Point and Multiplier:

Contacts among Asian stations and among non-Asian stations will neither count as a point or a multiplier.

For non-Asian stations — a perfect contact with Asian stations (excluding US auxiliary military radio stations in the Far East, Japan) will be counted as follows for point scores: *1.9 MHz band . . . 3 points; 3.5 MHz band . . . 2 points; other bands . . . 1 point.*

Multipliers are the number of different Asian Prefixes worked on each band, according to the WPX Contest rules. Eg JS1ABC/7 will count for prefix JS7.

Scoring: The sum of the contact points on each band times the sum of the multipliers on each band.

Instructions on the Summary and Log Sheet

Summary sheet — write in your declaration and signature to give evidence of following the rules of the contest, together with your DXCC country, call sign, entry class, multiplier by band, point by band and total score.

Log sheets — use a separate sheet for each band and keep all times in UTC. Fill in the blanks of multiplier by countries or prefixes only the first time on each band.

Awards: Certificates will be awarded to the highest scorers in each category on each continent and medals will be awarded to highest scorer in the single operator multi-band and multi-operator multi-band sections.

Reporting: Submit a summary sheet and logs of only one classification to JARL, All Asia DX Contest, PO Box 377 Tokyo Central, Japan. Please indicate phone or CW on the envelope. Envelopes should be postmarked no later than 30th July for the phone-section and 30th September for CW.

Disqualification: Violation of the contest rules, false statements in the report or taking points from duplicate contact on the same band in excess of two percent by the total will be deemed reasons for disqualification.

Announcement of Results: Phone about February 1987 and CW about April 1987.

Countries List of Asia: A4, A5, A6, A7, A9, AP, BV, BY, EP, HL/HM, HS, HZ/7Z, JA-JS/7J, JD1 (Ogasawara Island), JT, JY, OD, S2, TA2-8, UA/UN/UV/UW, UZ9-0 (AsRSFSR), UD, UF, UG, UH, UI, UJ, UL, UM, VS6, VU, VU (Andaman & Nicobar Islands), VU (Laccadive Island), XU, XW, XX9, XZ, YA, YI, YK, ZC4, 1S (Spratly Island), 3W/XV, 4S, 4W, 4X/4Z, 5B4, 7O (S Yemen), 8Q, 9K, 9M2 (W Malaysia), 9N, 9V (Singapore), J2/A (Abu Ail)

1985 RESULTS

Last year VI6DU was awarded a medal from JARL as the continental leader in Oceania for the Multi-op, multi-band section.

Certificate winners in VK were: VK6AOK, VI2PS, VK2XT, VK2PFQ, VK2APK, and VI6DU.

Other VK participants in the contest were: VK2KPF, VK5NOD, VI2PWS, VK4NAS, VK2DLB, VK3DVT, VK2BPC.

FIRST IARU HF CHAMPIONSHIP

The contest period is for 24 hours duration. Operating time for both single and multi-operator stations is 24 hours.

Operation may take place on 1.8-30 MHz. The 10, 18 and 24 MHz bands may *not* be used for contest OSOs.

IARU member society headquarters stations count as additional multipliers. These stations will be recognisable by the unique exchange they will transmit (see below).

For those not familiar with ITU zones around the world, a listing of countries and their corresponding ITU zone is included in this column. Proper forms, including a map are available from ARRL/IARU Secretariat, please send enough IRCs to cover return postage.

Eligibility: All licensed amateurs world-wide.

Objective: To contact as many other amateurs, especially IARU member society HQ stations, around the world as possible using 1.8 to 30 MHz, excluding the 10, 18, and 24 MHz bands.

Date: Second full weekend of July (12-13th July 1986).

Contest Period: 1200 UTC Saturday until 1200 UTC Sunday. Both single and multi-operator stations may operate for the entire 24 hour period.

Categories:

a Single operator — phone-only, CW-only and mixed mode. One person performs all operating and logging functions. Use of spotting nets is not permitted. All operators must observe the limits of their operators licenses at all times. Single-operator stations are allowed only one transmitted signal at any given time.

b Multi-operator — single transmitter, mixed mode only. Must remain on a band for at least 10 minutes at a time. Only one transmitted signal allowed at any given time. (Exception: *Only* IARU member society HQ stations may operate simultaneously on more than one band, with one transmitter on each band/mode. Only one HQ station call sign per member society per frequency band is permitted). All operators must observe the limits of their operators' licenses at all times.

Contest Exchange: IARU member society HQ stations send signal report and official IARU member society abbreviation. All others send signal report and ITU zone. A complete exchange must be logged for each valid QSO.

Valid Contact — The same station may be worked only once per band/mode. Mixed mode entries may work a station once per mode (but only in the generally accepted portions of that band for that mode. Note: Reworking a station in the phone portion of the band on CW is not permitted). Example: On any band, a station may be worked once on phone and once on CW (in the CW segment) for additional QSO credit. However, this counts as only one multiplier. Cross mode, cross band and repeater QSOs do not count. Where contest preferred segments are incorporated in regional band plans, participants are requested to observe them.

QSO Points:

a Contacts within your ITU zone, as well as QSOs with *all* IARU HQ member society stations, count as one point.

b Contacts within your continent (but different ITU zone) count three points.

c Contacts with a different continent count five points.

Multipliers: Total number of ITU zones plus IARU member society HQ stations worked on each frequency band. (Note: HQ stations do not count for zone multipliers).

Scoring: Multiplier times total number of QSO points.

Reporting:

a All entrants are encouraged to use the forms available from the ARRL/IARU Secretariat for return postage.

b Logs must indicate times in UTC, bands, modes, call signs, and complete exchange. Multipliers should be marked clearly in the log. Cross check sheets (dupe sheets) are required of more than 500 total QSOs are made.

c Entries *must* be postmarked within 30 days after the contest (13 August 1986). Any entry received after mid-October 1986 may not be received in time to be included in the printed results. Mail to 225 Main Street, Newington, CT 06111. USA.

Awards: A certificate will be awarded to the high-scoring CW only, Phone-only mixed-mode and multi-operator entrant in each US State, ITU Zone and DXCC Country. In addition, achievement-level awards will be issued to those making at least 250 QSOs or having a multiplier total of 50 or more. Additional awards may be made at the discretion of each country's IARU member society.

Conditions of Entry: Each entrant agrees to be bound by the provisions of these rules, by the regulations of his/her licensing authority and by the decisions of the ARRL Awards Committee, acting for the IARU International Secretariat. Usual contest disqualification criteria apply.

PREFIX, CONTINENT and ITU ZONE

A2	AF	57	TI	NA	11
A3	OC	62	TI	AF	47
A4	AS	39	TK	EU	28
A5	AS	41	TL	AF	47
A6	AS	39	TN	AF	52

A7	AS	39
A9	AS	39
AP	AS	41
BV	AS	44
BY	AS	33, 42, 43, 44
C2	OC	65
C3	EU	27
C5	AF	46
C6	NA	11
C9	AF	53
CE	SA	14, 16
CE0A	SA	63
CE0X	SA	14
CE0Z	SA	14
CM, CO	NA	11
CN	AF	37
CP	SA	12, 14
CT	EU	37
CT3	AF	36
CU2	EU	36
CX	SA	14
D2, 3	AF	52
D4	AF	46
D6	AF	53
DA-DP	EU	26
DU	OC	50
EA	EU	37
EA8	EU	37
EA8	AF	36
EA9	AF	37
EI	EU	27
EL	AF	46
EP	AS	40
ET	AF	46
F	EU	27
FT8W	AF	66
FT8X	AF	66
FT8Z	AF	68
FG	NA	11
FG, FS	NA	11
FH	AF	53
FK	OC	56
FM	NA	11
TR	AF	52
TT	AF	47
TU	AF	46
TY	AF	46
TZ	AF	46
UA1, 3, 4, 6	EU	16, 20
UA1 (FJL)	EU	75
UA - UZ2	EU	29
UA9 - UZ0	AS	20, 26, 30, 35, 75
UB	EU	29
UC	EU	29
UD	AS	29
UF	AS	29
UG	AS	29
UH	AS	30
UI	AS	30
UJ	AS	30
UL	AS	30
UM	AS	31
UO	EU	29
UP	EU	29
UQ	EU	29
UR	EU	29
V2-4	NA	11
V6	OC	54
VE, VY	NA	2, 3, 4, 9, 75
VK	OC	55, 56, 59
VK(LHI)	OC	60
VK9(W)	OC	60
VK9(K)	OC	64
VK9 (C, K)	OC	64
VK9(M)	OC	56
VK9(N)	OC	60
VK0(H)	AF	66
VK0(M)	OC	60
VP2	NA	11
VP5	NA	11
VP6(F)	SA	16
VP6	SA	73
VP9	NA	11
VQ9	AF	41
FO		
(Clip)	NA	10
FO	OC	63
FP	NA	09
FR	AF	53
FW	OC	62
FY	SA	12
G-GW	EU	27
H4	OC	51
HA, HG	EU	26
HB	EU	26
HC	SA	12
HH	NA	11
HI	NA	11
HK	SA	12
HK0(M)	NA	12
HK0	NA	11
HL, HM	AS	44
HP	NA	11
HR	NA	11
HS	AS	49
HV	EU	26
HZ, 7Z	AS	39
I, IS0	EU	28
J2	AF	48
J3	NA	11
J5	AF	48
J6-8	NA	11
JA	AS	46
JO, AS	OC	45
JT	AS	32, 33
JW	EU	16
JX	EU	16
JY	AS	39
W, K	NA	6, 7, 8
KC6	OC	64, 65
KG4	NA	11
KH1	OC	61, 62
KH2	OC	64
KH3-7	OC	61
KH6	OC	62
KH9	OC	65
KH0	OC	64
KL7	NA	1, 2
KP1-5	NA	11
VR6	OC	63
VS	AS	44
VU	AS	41
VU7	AS	41, 49
XE	NA	10
XE4	NA	10
XT	AF	46
XU	AS	49
XW	AS	49
XX9, CR9	AS	44
XZ	AS	49
Y2-9	EU	28
YA	AS	40
YB	OC	51, 54
YI	AS	39
YJ	OC	56
YK	AS	39
YH, HT	NA	11
YO	EU	28
YS	NA	11
YU	EU	28
YV	SA	11
YV0	NA	11
Z2	AF	53
ZA	EU	28
ZB	EU	37
ZC4	AS	39
ZD7-9	AF	66
ZF	NA	11
ZK1-3	OC	62
ZL	OC	60
ZP	SA	14
ZS	AF	57
1A0	EU	28
1S	AS	50
3A	EU	27
3B6-9	AF	53
3C	AF	47
3C0	AF	52
3D2	OC	56
3D6	AF	57
3V	AF	37
3W	AS	49
3X	AF	46
3Y	AF	67
KX6	OC	65
LA	EU	16
LU	SA	14, 16
LX	EU	27
LZ	EU	28
OA	SA	12
OD	AS	39
OE	EU	28
OF-OH	EU	18
OK	EU	28
ON	EU	27
OX, XP	NA	5, 75
OY	EU	18
OZ	EU	18
P2	OC	51
PA	EU	27
PJ2, 3, 4, 9	SA	11
PJ5, 6, 7, 8	NA	11
PY	SA	12, 13, 15
PY0	SA	13
PY0(T)	SA	15
PZ	SA	12
S2	AS	41
S7	AF	53
S9	AF	47
SJ-SM	EU	18
SP	EU	28
ST	AF	46
SU	AF	38
SV	EU	28
T2	OC	65
T30	OC	65
T31	OC	62
T32	OC	61, 63
T5	AF	46
T7	EU	28
TA, EU	AS	39
TF	EU	17
TG	NA	11
4S	AS	41
4U(ITU)	EU	28
4U(UN)	NA	08
4W	AS	39
4X	AS	39
5A	AF	38
5B	AS	39
5H	AF	53
5N	AF	46
5R	AF	53
5T	AF	46
5U	AF	46
5V	AF	46
5W	OC	62
5X	AF	46
5Z	AF	46
6W	AF	46
6Y	NA	11
7O	AS	39
7P	AF	57
7Q	AF	53
7X	AF	37
8P	NA	11
8Q	AS	41
8R	SA	12
9G	AF	46
9H	EU	28
9J	AF	53
9K	AS	39
9L	AF	46
9M2	AS	54
9M6, 8	OC	54
9N	AS	42
9Q	AF	52
9U	AF	54
9V	AS	54
9X	AF	52
9Y	SA	11
J2, A	AS	39

MEMBERSHIP

Gilbert Griffith VK3CGG
7 Church Street, Bright, Vic. 3741

I am not a writer, I am not even much of a talker. You may find me on the local repeater once a month and that is when I want to ask another amateur something. I haven't even plugged the microphone into my HF rig for six months!

I thought of writing an article about my different antennas, but if you saw the trouble I had with them you wouldn't want to know about it. I may have enough technical knowledge after 250 or so hours of study to pass the AOCP, but it took twice that long to get a good set of antennas flying. Just like 90 percent of you, right?

So now what do I do? Sit back and look forward to a long-life enjoying amateur radio and nothing else? Or apply myself and see what I can really put into it aside from the annual fees?

I have already put in a lot of effort with a couple of contests and have some awards under my belt. I found that the harder it was, the better I felt. The WIA 75 Award really looks good in a frame on the shack wall and it is a great thrill to scan the latest Amateur Radio to find out how you went in the last contest. A bit like how you felt when you completed your first CW QSO on air.

Consider what it costs to spend an hour or two a week in that little extra effort. You may have to miss out on talking to your mates about the latest happenings in your favourite TV soapy or to see the antics of the current TV hero . . . but you will probably learn a lot about a bunch of people you never knew before, new members.

Let us start by listing a few of the advantages of amateur radio. If you agree and want to do your own personal bit, then write them down and carry them with you, use them in conversations with your friends and tell them to your local newspaper editor. You can possibly think of many more, so write and tell me so we can share them.

Amateur radio is a way to sit down and talk to people, people from America, Japan, the Philippines, China or anywhere, without leaving the comfort or security of your own home. You can talk to an old-timer who may tell you about his experiences lugging a radio through war-torn enemy territory, or you may speak to a teenager worried about their HSC examinations, or where to find his next girlfriend. You can have friendly arguments and you can help to save lives in emergencies. There is no limit.

People will ask you about how to become an amateur. Don't just say *do the exams*, tell them how to go about getting started, have addresses handy so they can write for more information, tell them how hard it really is . . . and how worthwhile. Nothing will make it easy to get a full call licence, but with novice and limited levels it can be gradual. But everyone has to knuckle under and study, so let us convince them that it is time well spent.

My favourite dislike is the television (not to mention videos) so I often suggest that what you miss on the *box* won't really hurt you. The quiz shows won't do you any good unless you are on them and taking home the money — and just imagine the amount of study the big winners must do. And you won't remember the Sunday Movie for long, but I would wager that you can remember your first DX contact, or maybe that opening to Finland on 15 metres, last week.

You can show youngsters the advantages of a hobby that can gain them good employment. I noticed in the March Amateur Radio that the Antarctic Division is looking for communications officers, cooks and carpenters. There are jobs on ships, weather stations on the Islands, and countless other openings. The Antarctic Division of the Commonwealth Government is located at Kingston, Tasmania, (phone (002) 29 0209) — I looked the number up in the phone book.

Here a few suggestions for things I will be doing myself — not next year but this week.

Write or phone the WIA in your state and ask for a few copies of the pamphlet Amateur Radio, A Hobby for Everyone, *and give them to your friends, people you meet, or, if you are like me and hardly speak to your next-door neighbour, leave a few at the local newsagent, hotel, milk bar or library instead.*

Don't throw away those old AR magazines, give them to the local high school or library.

If someone is boring you to death talking about the TV soapies tell them about the rare station you spoke to at the South Pole where it was blowing a gale and was 80 degrees below zero outside.

They might even remember . . . do you?

NOTE: Gil has been a member of the WIA for 12 months, after attaining his licence in November 1984. He has been pondering on ways to encourage new members to the amateur radio fraternity and decided that maybe a regular column in AR exchanging ideas of recruiting new members, and providing general motivation may be a worthwhile experiment. What do other members think? Write to Gil with your thoughts.

ar

From QST — December 1985

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton. SA. 5014

AWARDS ISSUED RECENTLY

Worked All VK Call Areas (HF)

1448	David R Ellis ZL1BZL
1449	Jim Priest ZL2FS
1450	L R Baber VK2RJ
1451	Lorenz M Perry WA7CQE/DV2
1452	Keith J M Reid ZS6BRD
1453	Giorgio Baldassari IK5ACO
1454	Vilo Kuspal OK3MB
1455	Ryuji Nakayama JA0WRF

DXCC New Members

CW

126	Sam Galea VK2AKP

Phone

343	L R Baber VK2RJ

Open

233	John Meagher VK2AMV

Worked All VK Call Areas (VHF)

166	Geoff Wilson VK3AMK (2m)
167	Ronald J Watkins VK3XOA (6m)
168	Andrew Martin VK3KAQ (2m)

Apology for omission from DXCC ladder in April AR.

Open

292/22	Syd Molen VK2SG

CONGRATULATIONS

Ross Usher VK2ZRU, for being the first Australian to receive the WAC Award from the ITU with satellite endorsement.

BRISBANE AMATEUR RADIO CLUB AWARD

Requirement is to contact seven club members, or four club members plus the club station (VK4BA or VK4WK).

Club nets are held on Monday evenings, 28.445 MHz at 0930 UTC and Wednesday evenings on 146.550 MHz, at the same time.

To claim the Award send a log extract and $1 to the Awards Manager, BARC Inc, PO Box 300, Darra, Qld. 4076.

Thanks to Bob Semple VK4CE, for this information.

LAWRENCE HARGRAVES AWARD

Illawarra Amateur Radio Society sponsor this award for radio amateurs.

Requirements are to have one contact with the club station VK2AMW, which will be activated on 28th and 29th June 1986. All HF bands, two metres, 70 cm and 23 cm EME are included in the planned weekend, working from the club's EME site, just west of Wollongong, on the Illawarra escarpment.

Send $2 or four IRCs to the Award Manager IARS, PO Box 1838, Wollongong, NSW. 2500, quoting the following details:

Date, Time, Frequency, Mode, operator.

Thanks to Tony Mowbray VK2KAJ, the Club's Broadcast Officer, for supplying this information.

DIPLOMA FRACAP

The award is sponsored by the Radio Amateurs of Central America and Panama.

Two-way confirmed contact is required on any band, any mode, with each of the six member countries.

The countries are — Guatemala; El Salvador; Honduras; Nicaragua; Costa Rica and Panama.

Only contacts after 16th August 1985 are valid for this award and only contacts with amateurs affiliated to a radio club, member of FRACAP, are valid.

QSLs or a GCR list, certified by the radio club of which the applicant is a member should be sent, together with 10 IRCs or US$5 to the Awards Manager of Radio Club de Costa Rica, Bengt Hallden TI4BGA, Box 999, 3000 Heredia, Costa Rica.

Thanks to John Gough VK5QD, for this information.

JUBILEE INDUSTRY TRADE TRAIN SPECIAL AWARD

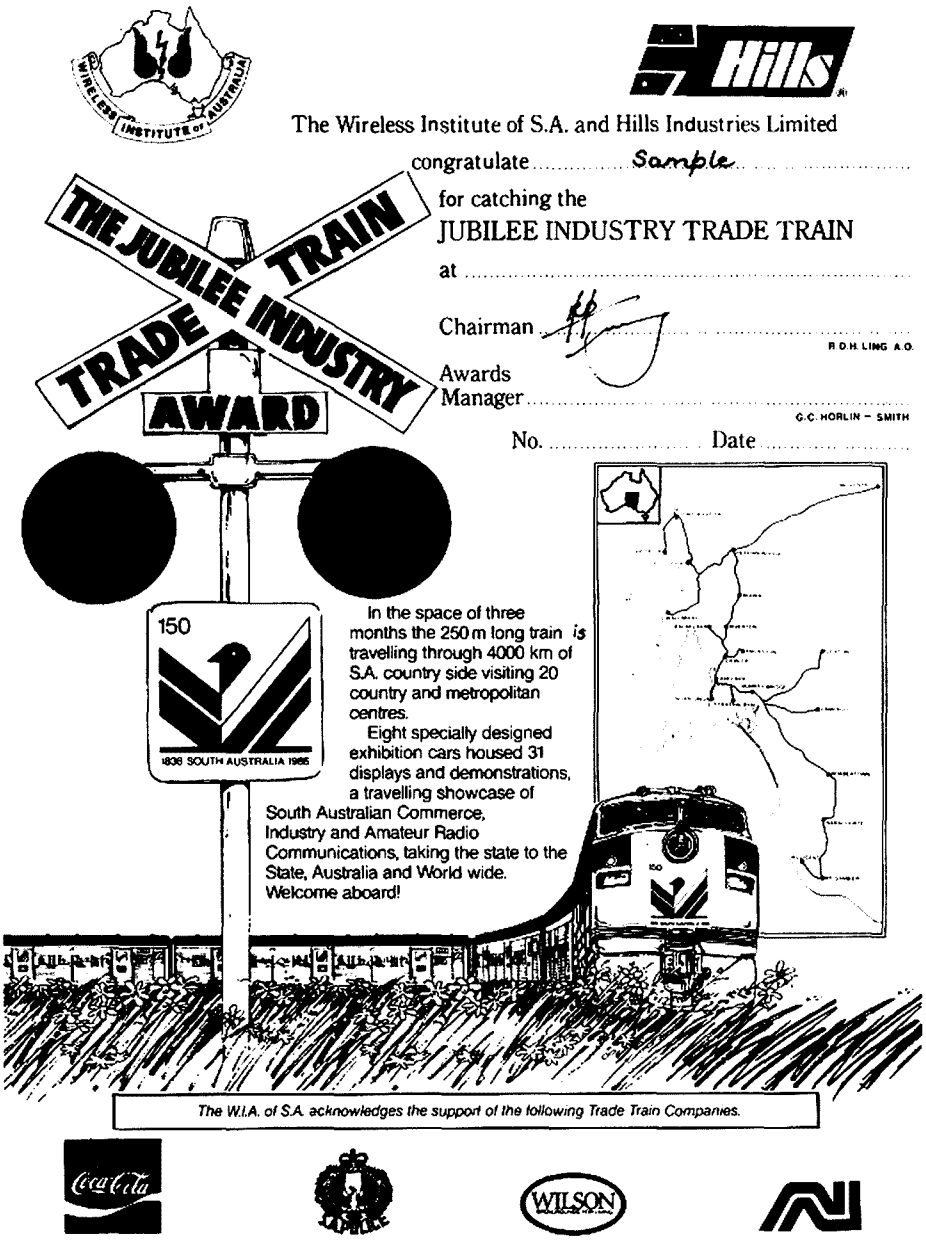
This is available for one contact with amateurs on the Trade Train.

A five-colour artists impression of the Jubilee 150 Trade Train en route through the SA countryside, with the award details on the map of South Australia together with the locations or whistle stops from which the stationary amateur station can be worked for the award and Jubilee 150 points make up this attractive award.

Signatory of the award is Mr Bob Ling, Chairman of the Jubilee 150 Executive Committee and Managing Director of Hills Industries SA.

The award includes a documentary of the train's historic journey. The story will appear with written acknowledgment on the presentation of the award.

The award is offered to one contact QSL cards to *Trade Train Award, WIA (SA), PO Box 1234, Adelaide, SA 5001. (Cost $2 or four IRCs for packaging and postage) or direct to Graham*



Horlin-Smith VK5AQZ, 2 Athol Avenue, Tranmere, SA. 5073.

CAPE WILLOUGHBY LIGHTHOUSE, KANGAROO ISLAND, JUBILEE 150 AWARD

Applications for this attractive award should include a one contact QSL card to *Kangaroo Island Award, Graham Horlin-Smith VK5AQZ,* (address as above). Include $2 or four IRCs for postage and handling.

One contact with the Jubilee 150 DXpedition to Cape Willoughby Lighthouse, Kangaroo Island, qualifies for this award.

The award is signed by the Mr Neville Cordes, Mayor of Kingscote, Kangaroo Island.

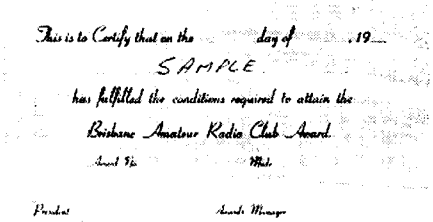
The award is four colours, designed overlay of the Cape Willoughby Lighthouse featuring a wealth of tourist attractions on Kangaroo Island including a short history of the Island's beginning as South Australia's first colony.

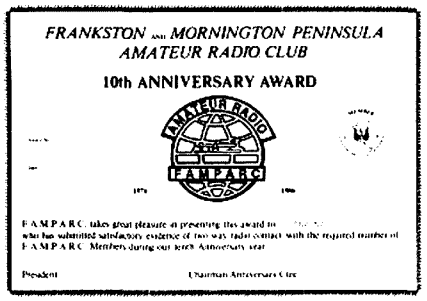
ar

WIA 75 AWARD RICIPIENTS

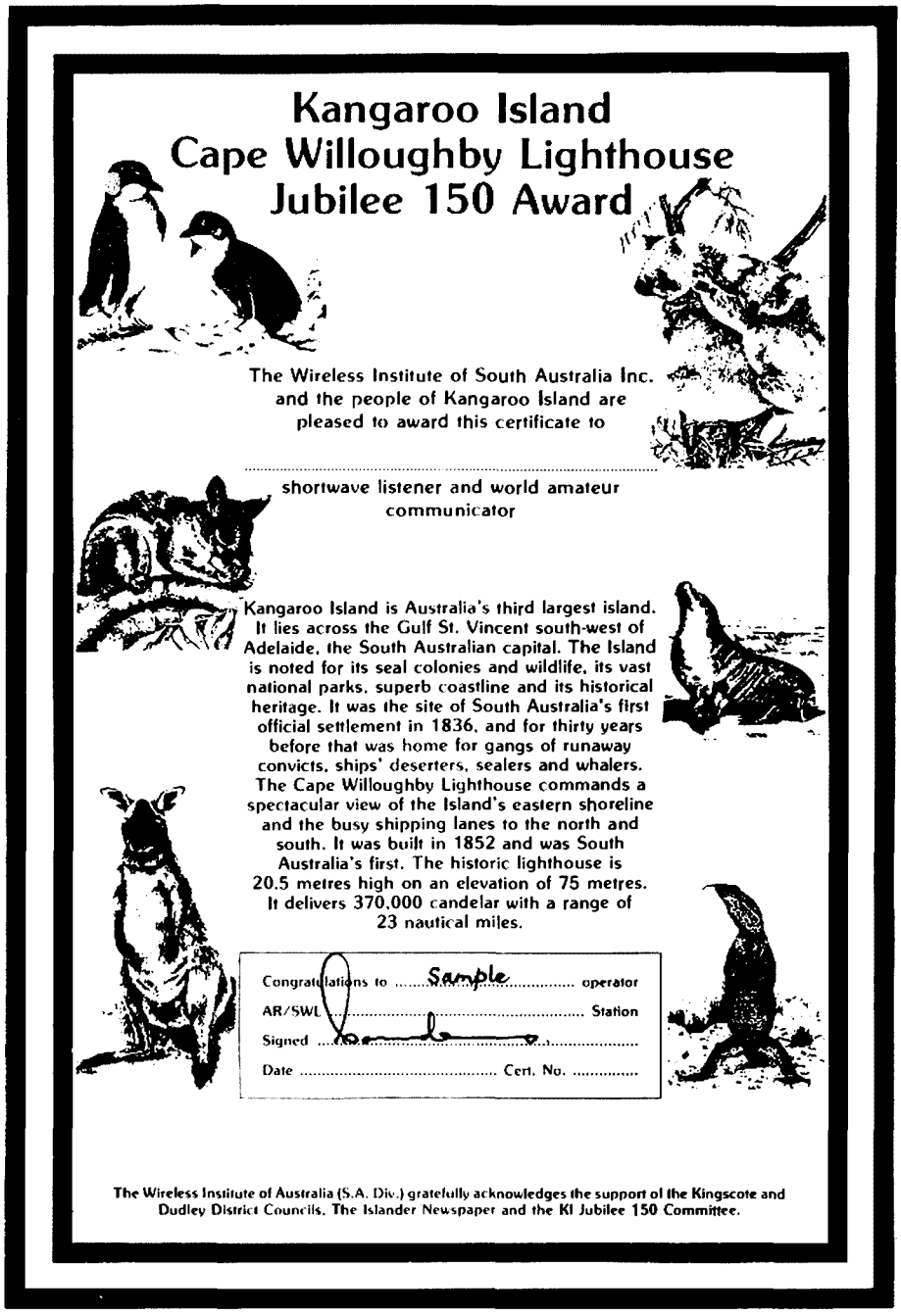
588	John Ferrington VK2VOX
628	Jeanne Gilchrist ZL2BOD
629	Henri Vandevelde ON4VN
630	Gerhard Schumacher DJ7PB
631	R Chakravarthy VU2TTC
632	Tom Ellis ZL3KN
633	Anne Griffiths ZL2BOV
634	Don McDonald VK5ADD
635	Mario Ambrosi I2MQP
636	Egbert Heretsen ONL4003
637	Kurt Brauer HB9AMZ/SWL
638	T Thornton VK2PJT
639	Pentti Lareva OH3TY
640	Wally Rueger KC9WQ
641	Anton Iriawan YB5QZ
642	Dieter Albrecht DL2KBH
643	Klaus-Peter Weinborner DK8DB
644	William Tanujaya YC0DNK
645	Ross W Forbes WB6GFJ
646	Charles K "Rusty" Epps W6OAT
647	Shinji Maeda JG6PCA
648	Hiroshi Harada JE4OJD
649	Edurad H Pandoe YC2AFP
650	Denis Kleen SM6OOI
651	Jukka Kovanen OH6-145 SWL
652	A Katarzynski VK4JXZ
653	Peter Dann VK3CPD
654	Lee Ping Kee VS6TQ
655	Margaret Schwerin VK4AOE
656	Tom Weston KB7MJ
657	Soebijakto Adinegoro YC0BCA
658	T K Morrison VK3DVZ

BRISBANE AMATEUR RADIO CLUB AWARD





To obtain the FAMPARC Award see rules, page 43, May AR.



NEED A POWER SUPPLY

Recently Don VK2TMP was looking for (and still is) a power supply, and happened to mention the fact to a colleague. Said colleague, with a sly grin, handed Don an article and said it may be of interest to him. Following are excerpts describing the *power supply? ? ?*

The Itaipu hydro-electric project in SW Brazil is the largest installation of its type in the world and everything about it is gargantuan, including the transmission system which transmits 12 600 MW from the interior to the industrialised coast. The EHV voltage lines — 345, 500 and 750 kV, plus HVDC into a single package.

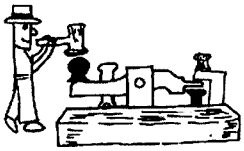
The project straddles the Parana River and will have 18 700 MW turbine/generators. These are the largest generator sets ever built and will have a total capacity, when running, of six times that of the Aswan High Dam Project on the River Nile, Egypt.

Thyristor valves, the largest of their kind, are housed in clean-air, pressurised valve halls, which are basically immense Faraday cages, to prevent interference with telephone and control circuits from the intensives fields generated within the building. The thyristors are rated at 3 000 amps and require water-cooling. A water-treatment plant with a capacity of 1 804 cu metres per day supplies pure water in the amount of 1 116 cu metres a day for the valves. The water is demineralised and deoxygenated before use. Each valve has 96 series connected thyristors which are controlled via a fibre-optic triggering system.

Don states fascination, rather than interest was a more apt description of his feelings. 'Just imagine thyristors rated at 3000 amps, requiring a water treatment plant to supply their cooling water, a massive 12600 MW and voltages of 345, 500 750 kV and ± 600 kV DC — some power supply!"

Contributed by Don Palmer VK2TMP from The Shire & Municipal Record, June 1985.

ar



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

CW FOREVER!

Following on the coincidences from last months column — I received a poem from Hans VK5YX, and was to use it in this months column, however, as coincidences would have it, the poem appeared in April AR, page 47. Hans received the poem by a very circuitous route from the Tucson IBM Amateur Radio Club in the USA.

(Please read the poem before continuing.)

From a literary point-of-view it is only doggerel at best, but there are many who share the sentiments.

I number myself among those who regard CW as something more than a technique, something approaching an art form. Evidently it has now been elevated to a religion! I like the image of a Silent Key pulling that final lever. I guess there is a limited supply of words that rhyme with forever.

If I can stray slightly off the subject of CW for a moment, I was intrigued that the poem found its way here via a computer user group. The last version of my word-processing software incorporated a very good spelling checker. The current version has an improved speller *and a thesaurus!* I wonder if the state of the art in the USA includes a rhyming dictionary. . .

Brass pounders prefer CW to phone for any number of reasons, but there is always the knowledge that when it comes to the crunch, this antique mode is superior to phone. It may be that it doesn't have to *come to the crunch*. There are situations where CW can be superior even when conditions for phone are perfect.

Recent correspondence with Lindsay VK3ANJ, challenges phone operators. With a son in the Country Fire Authority, Lindsay is convinced that WICEN voice traffic nets are inefficient in comparison with CW nets. Having monitored a lot of the emergency WICEN traffic during the Ash Wednesday Disaster, I am inclined to agree. Given the amount of phonetic spelling and repetition required to pass a simple message on two metres, I suspect a pair of competent brass pounders would leave the *mike-bashers* for dead. Especially if the phone-ops included some of the operators I have heard who take the trouble to phonetically spell the word *TANGO HOTEL ECHO!*

Lindsay proposes a shootout. He has come up with a proposal for a contest between teams of phone operators and teams of CW operators to resolve the issue once and for all. Each team would consist of eight operators, one from each call area, and the contest would involve relaying a message from VK3 to VK1, via VK7, 5, 6, 8, 4 in that order. Winners would be judged on accuracy of text and time of receipt in Canberra.

The idea has a lot of merit, but I see some problems with the proposed format — for example, waiting team-members could sandbag earlier transmissions several times (which, of course, would tend to favour the CW operators). And who would you get to judge the results?

Maybe the judging wouldn't be too much of a problem if you got a non-amateur, non-technical person with some interest in communications to do it — like perhaps the Minister for Defence. And the sandbagging possibilities could be overcome by making it a point to point exchange, with a CW and phone operator in close proximity at each end.

What do you think? Please let me know, and if there is enough interest I will see if I can get the WIA to organise it.

While we are on the subject of contests, it appears to me that, given the size of the amateur population in Australia, the two contests of most interest to CW operators, the RD and the John Moyle, present certain disadvantages. The RD demands an entire weekend, which limits the scope of a CW-only operator. The JM offers a six-hour section, but demands the effort of setting up a portable station for the sake of those six hours (or you can use the home station and try to work three times as many stations).

Both of the cited contests have to cater for a lot of people with varying interests — so they become quite complex in terms of rules.

I propose a CW Sprint. An all out three-hour CW contest on 80 metres on a Saturday night. Again, if you like the idea (or object to it) drop me a line.

Finally, in case any phone operators have taken offence to anything in this column I had better say that I am not a CW crank; any apparently disparaging comments were intended only to promote competition. To prove it, I will gladly enter an HF phone sprint if someone would like to organise it.

73 till next month.

AR

RADIOTELEGRAMS

STATION	CALL SIGN	FREQ kHz	HOURS UTC	REMARKS
ADELAIDERADIO	VIA	*500*	Continuous	Watch calls and replies
		472	Continuous	Primary working frequency
		512	Continuous	Supplementary calling frequency
		4272.5	Hx	As required
		6463.5	Hx	As required
BRISBANERADIO	VIB	*500*	Continuous	Watch, calls and replies
		435	Continuous	Primary working frequency
		512	Continuous	Supplementary calling frequency
		4230.5	Hx	As required
		6351.5	Hx	As required
BROOMERADIO	VIO	*500*	Continuous	Watch, calls and replies
		440	Continuous	Primary working frequency
		512	Continuous	Supplementary calling frequency
		4323.6	Hx	As required
		6407.5	Continuous	Guards 6 MHz (Ch 5-6), 8 MHz (Ch5-6)
CARNARVONRADIO	VIC	*500*	2300-1200	Watch, calls and replies
		476	2300-1200	Primary working frequency
		512	2300-1200	Supplementary calling frequency
		4323	Hx	As required
		6407.5	2300-1200	Guards 6 MHz (Ch 5-6)
DARWINRADIO	VID	*500*	Continuous	Watch, calls and replies
		445	Continuous	Primary working frequency
		512	Continuous	Supplementary calling frequency
		4272.5	Hx	As required
		6463.5	Hx	As required
		8487	Continuous	Guards 8 MHz (Ch 5-6)
ESPERANCERADIO	VIE	*500*	2300-1200	Watch, calls and replies
		435	2300-1200	Primary working frequency
		512	2300-1200	Supplementary calling frequency
		4323.6	Hx	As required
		6407.5	Hx	As required
MELBOURNERADIO	VIM	*500*	Continuous	Watch, calls and replies
		430	Continuous	Primary working frequency
		512	Continuous	Supplementary calling frequency
		4228.5	Hx	As required
		6333.5	Hx	As required
PERTHRADIO	VIP	*500*	Continuous	Watch, calls and replies
		484	Continuous	Primary working frequency
		512	Continuous	Supplementary calling frequency
	VIP7	*4229*	Hx	Ch 5-6 and 16
	VIP2*	*6407.5*	Hx	No watch kept
	VIP3	*8597*	Continuous	Guards 8 MHz (Ch 5-6 and 16)
	VIP4	*12994*	Continuous	Guards 12 MHz (Ch 5-6 and 16)
	VIP5	*16947.6*	0600-1000	Guards 16 MHz (Ch 5-6 and 16) Daily
	VIP5	*16947.6*		Guards 16 MHz (Ch 5-6 and 16) Daily
	VIP6	*22315.5*	On request	Guards 22 MHz (Ch 3-4 and 10)
ROCKHAMPTONRADIO	VIR	*500*	2200-0730	Distress, emergency auto alarm receiver watch only
		4255.6	2200-0730	Guards 4 MHz (Ch 5-6 and 16)
		6333.5	Hx	As required
SYDNEYRADIO	VIS	*500*	Continuous	Watch, calls and replies
		476	Continuous	Primary working frequency
		512	Continuous	Supplementary calling frequency
		440	Continuous	Secondary working frequency
	VIS53	*4245*	1300-2100	Guards 4 MHz (Ch 5-6 and 17)
	VIS3	*6464*	0800-2200	Guards 6 MHz (Ch 5-6 and 17)
	VIS35* *	*8352*	Hx	As required
	VIS26	*8521*	Continuous	Guards 8 MHz (Ch 5-6 and 17)

* *Presently not in use.*

	VIS5	*12952.5*	Continuous	Guards 12 MHz (Ch 5-6 and 17)
	VIS49* *	*12979.5*	Hx	As required
	VIS6	*17161.3*	2100-1300	Guards 16 MHz (Ch 5-6 and 17)
	VIS62* *	*17138.4*	2100-1300	As required
	VIS42	*22474*	2200-0800	Guards 22 MHz (Ch 3-4 and 9)
	VIS43* *	*22495*	2200-0800	As required
* * *Secondary frequencies*				
THURSDAY IS.RADIO	VII	*500*	Continuous	Watching, calls and replies
		488.5	Continuous	Primary working frequency
		512	Continuous	Supplementary calling frequency
		4228.5	Hx	As required
		6333.5	Continuous	Guards 8 MHz (Ch 5-6)
TOWNSVILLE-RADIO	VIT	*500*	Continuous	Watch, calls and replies
		420.5	Continuous	Primary working frequency
		512	Continuous	Supplementary calling frequency
		4255.6	Hx	As required
		6463.5	Continuous	Guards 8 MHz (Ch 5-6)

TRAFFIC LISTS

STATION	CALL SIGN	FREQ kHz	HOURS UTC
ADELAIDERADIO	VIA	472 6463.5 (Day) 472 4272.5 (Night)	0018; 0440; 0840; 1018; 1240 1640; 2040
BRISBANERADIO	VIB	435 6351.5 (Day) 435 4230.5 (Night)	0010; 0410; 0810; 0948; 1210 1610; 2010; 2318
CARNARVONRADIO	VIC	476 6407.5 (Day) 476 4323 (Night)	0005; 0200; 0348; 0605; 0805 1130
DARWINRADIO	VID	445 8487 (Day) 445 4272.5 (Night)	0048; 0448; 0848; 1048; 1248 1648; 2048
ESPERANCERADIO	VIE	435 Only	0010; 0048; 0210; 0610; 1010; 1118
THURSDAY ISLANORADIO	VII	488.5 6333.5 (Day) 488.5 4228.5 (Night)	0018; 0418; 0818; 0918; 1218 1618; 2018
MELBOURNERADIO	VIM	430 6333.5 (Day) 430 4228.5 (Night)	0300; 0700; 0900; 0948; 1100 1500; 1900; 2300; 2318
BROOMERADIO	VIO	440 6407.5 (Day) 440 4323.6 (Night)	0010; 0118; 0410; 0810; 1230 1610; 2010
PERTHRADIO	VIP	464/HF	0100; 1200 and at each even hour plus 20 minutes
ROCKHAMPTONRAOI-O	VIR	4255.6 (HF only)	0048; 0216; 0418; 0618; 2218
SYDNEYRADIO	VIS	476/HF	0918; 2248 and at each even hour plus 50 minutes on MF and "primary" HF frequencies and at each odd hour plus 50 minutes on "secondary" HF frequencies between 2350 and 0950 inclusive
TOWNSVILLERADIO	VIT	420.5 6463.5 (Day) 420.5 4255.6 (Night)	0230; 0630; 0930; 1030; 1430 1830; 2230; 2348

DISTRESS, SAFETY & WEATHER SERVICES

STATION	CALL SIGN	FREQUENCY	HOURS UTC
ADELAIDERADIO	VIA	472 4272.5+ 6463.5	0018, 1018
BRISBANERADIO	VIB	435 4230.5+ 6351.5	2318, 0948
BROOMERADIO	VIO	440 4323.6+ 6407.5	0118, 1230
CARNARVONRADIO	VIC	476 4323+ 6407.5	0200, 1130
DARWINRADIO	VID	445 4272.5+ 8487	0048,1048
ESPERANCERADIO	VIE	435 4323.6+ 6407.5	0048, 1118
MELBOURNERADIO	VIM	430 4228.5+ 6333.5	2318, 0948
PERTHRADIO	VIP	484* 4229 8597 12994	0100, 1200*
ROCKHAMPTONRADI-O	VIR	4255.6+ 6333.5	0048
SYDNEYRADIO	VIS	440 8452	2248, 0918
LONGRANGE (OCEAN & HIGHSEAS) BROADCASTS SYDNEYRADIO	VIS	4286 6428.5 6478 12907.5 16918.8 22465	0100, 0500, 0800 1300, 1700, 2100 Long Range Navy Warnings Only
	VIX*	4286 6428.5 8478 12907.5 16918.8 22485	0130, 0530, 0930 1330, 1730, 2130 Ocean & Highseas Weather Forcasts
*Transmited by RAN Canberra			
THURSDAY ISLANDRADIO	VII	488.5 4228.5+ 6333.5	0018, 0918 (NX — Gale/Storm Warnings only)
TOWNSVILLERADIO	VIT	420.5 4255.6+ 6463.5	0930, 2348
+ Indicates "Night time" transmit frequency			

QSP

1926 TRANS PACIFIC TESTS

Between 23rd May and 5th June 1926, the WIA asked Australian amateurs to take part in tests with America to determine:

— to discover the most reliable and effective amateur station in each of the Australian and American States
— to establish definitely the hours during which reliable amateur communication can be maintained across the Pacific
— to stimulate interest in observations on waves as low as five metres
— to discover the Australian amateur station that can correspond with an American amateur station on three separate nights of the test period with the minimum total input power.

The tests were being organised by the then Honorary Federal Secretary, Ross A Hull.

The WIA's Federal Executive Council in 1925/26 had its Headquarters in the Royal Society's Building, 5 Elizabeth Street, Sydney. Telephone B 2235. Postal address was Box 3120P, GPO Sydney. President was Phil Renshaw, and Honorary Treasurer H A Stowe.

The WIA letter-head of the day included the following: *The Institute is established for the purpose of encouraging the scientific study of wireless telegraphy and telephony in Australia, and to promote the intercourse of those interested in the subject and to aid them with advice and instruction.*

There will be further articles on the 1926 Tests in a later edition. Are there any amateurs or SWLs who took part in those tests or have information they could pass on? If so, please advise the Federal Office.

Contributed by Tim Mills VK2ZTM, based on information supplied from the files of the Waverley Amateur Radio Club, VK2BV by Duane VK2VE. (See page 64, November 1985 Amateur Radio).

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA Get-Together 1985, at *Glen Osmond* Woodend Vic. Standing from left: Janet VK3BTU, Bron VK3DYF, Warren VK3BYD, Muriel May and daughter Charlene. Front: Bonnie VK3PBL, Marjorie VK3HQ, Valda VK3DVT, Joan VK3NLO, Margaret VK3DML, and Mavis VI3KS.

Hello again! How quickly the months go by, and ALARA is nearly 11 years old.

As part of our celebrations this year, we are pleased to announce a special ALARA Birthday YL Activity Day on Saturday, 26th July from 0400-1200 UTC. Phone only, all bands. (Frequencies as for the ALARA Contest). YLs to contact YLs.

Sorry fellas! YLs only this time, but the ALARA Contest is coming shortly, and we will be very pleased to hear from you then.

WIA 75th ANNIVERSARY MEDALLIONS

The following ALARA members have been awarded WIA 75th Anniversary Medallions.
Marilyn Syme VK3DMS — Zone and Club Net Controller, VK3 Division.
Austine Henry VK3YL — Assistance to WIA, particularly VK3 Division.
Margaret Schwerin VK4AOE — VK4 ALARA Representative. Assistance to Dalby Amateur Radio Club and the only YL member.
Jenny Warrington VK5ANW — VK5 Division Secretary, Vice-President and Columnist.
Marlene Austin VK5QO — Written history of VK5 Division 1919-1980.
Joy Charles VK5YJ — WICEN Roster Co-ordinator. Yachting Trails Co-ordinator.
Christine Bastin VK6ZLZ — Divisional Councillor.
Gil Weaver VK6YL — Divisional Councillor.
Daphne Hugo — On behalf of the Ladies Luncheon Group.

Congratulations ladies, on a very fine achievement.

ALARA AWARD

Recipients of the ALARA Award from January to March 1986 are as follows.

No/Date 1986	Name Call Sign/Stickers
115/22.1	**Mervyn Vinicombe VK1MV**
116/21.2	**Maree Smirow VK2NKN**
117/21.2	**Jeanne Gilchrist ZL2BOD/4**
118/19.3	**Mary McDonald WB5LBR**

NEWSLETTER

Our long-time Editor of the ALARA Newsletter, Marlene VK5QO, is *retiring* from the position after five years. During that time the Newsletter has grown, both in content and standard of material, a tribute to Marlene's journalistic capabilities. We owe her a very big vote of thanks for all the time and effort she has put into making it such an enjoyable and readable publication. (Cases exist of ALARA members not being able to read their Newsletter when it arrived because the OM had got to it first, and they had to wait until he had finished reading it!).

The new Editor, from July, will be Bron VK3DYF, and any items for the Newsletter should be sent to her: Bron Brown, 99 Foam Street, Rosebud, Vic. 3939. Our best wished to you Bron. I am sure you will do an excellent job.

ZL2 YL GET-TOGETHER

What a fabulous day. The sun shone, the birds sang and the wind did not blow. We gathered together in friendship at Sylvia's place (ZL2LS), Napier on 22nd February 1986.

The day took on the form of a garden party. We sat under the magnificent trees in Sylvia's garden, out of the hot sun, and chattered and reminisced, caught up with old friends, made new ones, put faces to the voices we often *work on* the air, and really enjoyed ourselves.

We had each brought a plate of food which we shared, a Pot Luck Lunch. This we had outside in the shade so we ate and enjoyed the view of the gardens.

Back from Left: Pearl ZL2QY, Biny ZL2AZY, Jos ZL2BAO, Aola ZL1ALE. Front: Marilyn ZL2BOA, Jeanne ZL2BOD and Cathy ZL2AOK.

After lunch we had a photographic session of the WARO members and groups of the girls who belonged to overseas YL amateur radio organisations. The OMs were included in the day and had their photographs taken, too.

Shortly after 3pm, various ones who had to get-away reluctantly said their good-byes and expressed their hopes for meeting again in the near future. It really was a truly fabulous day.

Thanks to Marilyn ZL2BOA for this information.

ODDS-N-ENDS

Congratulations to the ALARA members who assisted with the amateur radio segment of the *Airwaves* program, broadcast on ABC, earlier in the year, notably Helene VK7HD and Marilyn VK3DMS. Congratulations to Marilyn also on being the first VK member of the Belgian Young Ladies' Club.

Denise VK5YL, would like to sponsor someone, anywhere, who would be interested in contacts on CW. There must be some CW enthusiast among the YLs out there somewhere who would like to be sponsored into ALARA.

I have been informed by an ALARA member, that the meaning of *33* given in this column in March, was not correct. She gives the original meaning as *Love sealed with friendship between one YL and another.* The version printed, apparently, came later. My apologies for getting it wrong!

CORRECTIONS TO YL ACTIVITIES LIST (APRIL AR)

The VE/VK/ZL YL Net on 14.160 MHz, Fridays at 0500 UTC is a *phone* not a CW net.

The Monday YL-DX Net on 14.220 MHz now starts at 0600 UTC, not 0630.

THE 220 YL NET

This net is still run most competently by Barry VK7GE. (Think I'll resort to a little versifying!).

Every Monday at 0600
We wait on frequency;
Listening for the familiar tones
Of VK7GE.

Our Barry calls us each in turn,
And keeps us all in order,
And handles most effectively
The odd OM disorder.

YLs all around the world
Are waiting patiently.
He's got more ladies in his book
Than the Sheik of Arab-ee!

He has a cheerful chat with each.
We never hear him flustered;
He does not raise his voice or shout
Where others may have blustered.

He smoothes the way for rare DX
And gives us all a try;
Hears the faintest YL voices,
Never lets one pass him by.

There are girls from England, Belgium, France, Sweden and Italy,

New Zealand, USA, Brazil, Zimbabwe and Fiji.

From many places round the globe
We hear the cheerful greetings,
And catch up with our friends again
In pleasant on-air meetings.

So thank you, Barry, from us all
For such a friendly net.
Hope to meet you on a Monday night
For many a long year yet.

Until next month, 33/73, Joy VK2EBX. ar

Radio Amateur Old Timers Club

John Tutton VK3ZC
11 Cooloongatta Road, Camberwell, Vic.

Following are the results of the March QSO Party held on 20 metres.

Call	Mode	QSOs	Areas	Total
VK4RF	CW/SSB	38	10	1900
VK6HC	SSB	31	9	1395
VK3JA	CW/SSB	26	9	1170
VK5SJ	SSB	29	7	1015
VK3KS	CW/SSB	23	8	920
VK3XB	CW/SSB	23	8	920
VK3LC	CW/SSB	22	8	880
VK2PU	CW/SSB	24	7	840
VK7RF	SSB	21	8	840
VK2AWA	SSB	18	8	720
VK4OX	SSB	23	6	690
VK7CH	CW	16	7	560
VK3XF	CW/SSB	16	6	480
VK4AEM	SSB	14	6	420
VK7RY	CW/SSB	13	6	390
VK5RK	SSB	15	5	375
VK4BG	SSB	12	6	360
VK5KV	SSB	12	5	300
VK7BJ	SSB	12	5	300
VK3YW	CW	5	4	100
VK3NA	SSB	3	1	15
ZL2KM	CW/SSB	25	9	1125
ZL2RP	SSB	24	7	840
ZL3BJ	CW/SSB	21	8	840
ZL2AB	CW/SSB	19	7	665
ZL2AT	SSB	15	7	525
ZL4ID	SSB	21	5	525
ZL2RI	SSB	13	6	390

As seems to be the usual thing for March, old man Skip had quite an effect on contacts in the 20 metre QSO Party.

Comments indicate, however, that those taking part, or at least those who forwarded logs, had an enjoyable three hours. There were 22 logs submitted from the 43 VKs who were active, while ZL numbers were seven logs from a reduced total of 10 active.

Overseas members, John Stewart W6GTI, and Les Clarke ZS5NU, worked by VK6HC would have been eagerly sought if they had been on longer.

Cross-checking of logs shows that some of our Old Timers must still be using phonetics of the *ACK, TQC* and *EMMA* days. Smarten up fellers, there were quite a number of call sign errors. But maybe it is due to all those old carbon micrpphones still in use out there!

In your returns would you please indicate the mode you were using.

Thank you for your comments on the contact exchange suggestions. There will be no change certainly for the August Parties (remember there are two, 40 and 80 metres), but these columns will keep you posted.

73 John VK3ZC. ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Reports were received with thanks for the month of February, from the following: *VK2s BOS; DEJ; PS; QL; SWL A Bradford; VK3s XB; XU; VK4s AKX; BG; BHJ; BTW; DA; KAL; KHZ; MR; NGF; VK5s BJF; GZ; TL; VK6s JQ; XV; XZ; VK7RH; VK8s HA and JF.*

There were 835 broadcast (A3E) intruders reported — 271 CW (A1A), 282 RTTY (F1B), 156 other modes (Woodpecker, R7B Multiplex, etc) and 73 intruders gave identifying call signs.

Of particular interest to Norman VK4BHJ and Jim VK2BQS, will be the news that the following intruders are all part of the Vietnamese News Agency — VCN; KFB; CFK; VZC; NBZ; PKJ and VMO. Last, but certainly not least is VRQ.

NEW ADDRESS

Bruce VK6XZ, the Western Australian IW Co-ordinator advises of a change of mailing address. Any future reports can be sent to Bruce Hunt VK6XZ, 59 Pembury Road, Thornlie, WA. 6108.

Also, we have a new Intruder Watch Co-ordinator for the VK1 area, namely Alan Hawes VK1WX, PO Box 547, Dickson, ACT. 2602. Welcome to the ranks Alan, and belated congratulations on the move from VK1KAL to VK1WX. ACT amateurs or SWLs can send any reports to Alan.

BEACONS AND TAXI-CABS

The 'V' Beacon, on or about 7.003 MHz, is also being heard in the Federal Republic of Germany. This was reported as being in Vladivostok by the IARU Region 2 Monitoring System Co-ordinator, W7JIE.

We are still trying to establish the origins of the alleged taxi-cab operation being heard on the lower end of 28 MHz, and purporting to e coming from Hong Kong. Taiwan.

EXPANSION OF BANDS

And an interesting note from *Practical Wireless*, January 1986. Proposals made by the ARRL seeking expansion of the current 28 MHz band section used by the US Novice Licence Holders could, if adopted, create world-wide problems. The international beacon system mainly operates within the agreed sub-band 28.200-28.300 MHz; the ARRL proposal is to allow multi-mode novice operation down to 28.100 MHz (the current US lower phone limit is 28.300). The use of CW, SSB and RTTY within this sub-band will obviously affect the beacon system and it should be remembered that if the novice allocation goes through, US general and higher licence classes will automatically be allowed use of the same frequencies, with up to full legal power. It is further understood that ARRL, in recognition of this fact, would initiate proposals to reorganise and move the beacon network.

It is pleasing to report that I have received my 109 QSL cards back with DXCC from the ARRL, and have to worry about the cards no longer!

See you next month, and will be looking for your intruder report!

Acknowledgments: VK4AKX and Practical Wireless.
ar

CITIZEN OF YEAR AWARD

Sam Voron VK2BVS was recently one of five people awarded Citizen of the Year by the Willoughby Council.

Sam was honored with this award for the tireless efforts and compassion shown by him during the Mexican Earthquake Disaster.

When not *out and about* demonstrating amateur radio to the public at every possible opportunity, Sam operates from his shack below his parents house in Roseville, New South Wales.

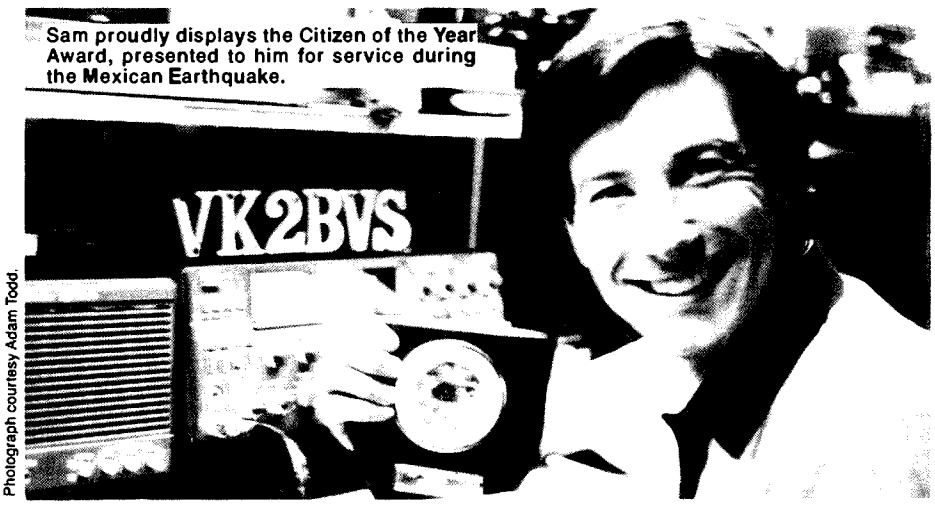
Sam's interest in radio was aroused when, as a lad of 11, he happened to hear the Voice of America via shortwave on his small transistor radio. Sam wrote off to VOA advising them that he had heard their signals and was thrilled to receive VOA QSL cards.

With this success, Sam then wrote to ships, planes, and the US navy, army and air force. He has heard Francis Chichester on his solo voyage around the world, the first Chinese space satellite (playing the national anthem) in 1966, Radio Hanoi broadcasting to US servicemen and an aeroplane flying to Khartoum from Cairo radioing a message that it was turning back as one propeller had stopped. By this time Sam was hooked on radio, and was given a walkie-talkie when he was 13, so that he could talk as well as receive.

By the time he was 17, Sam had sat for the amateur examinations and received his radio licence.

Last November, Sam relayed a message of congratulations from President Reagan to the WIA on the occasion of its 75th Anniversary. Sam believes that President Reagan has a national communication plan that, in the event of a nuclear attack, should all other communications be wiped out, the first links to bring the country together will be amateur radio operators across the nation.

Abridged from North Shore Advocate, 9th April 1986.



Sam proudly displays the Citizen of the Year Award, presented to him for service during the Mexican Earthquake.

Photograph courtesy Adam Todd.

AMSAT Australia

Colin Hurst VK5Hi
8 Arndell Road, Salisbury Park, SA. 5109

OSCAR-10 APOGEES
J U N E 1 9 8 6

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st June										
152	2231	0123:48	-24	255	272	42	282	54	308	75
2nd June										
153	2233	0042:52	-24	246	278	51	291	62	351	80
3rd June										
154	2235	0001:55	-24	236	286	60	307	70	42	77
154	2237	2320:59	-24	227	299	68	336	76	66	69
4th June										
155	2239	2240:02	-24	217	322	75	19	76	77	61
5th June										
156	2241	2159:06	-23	208	4	78	50	71	84	52
6th June										
157	2243	2118:10	-23	199	43	74	67	63	90	43
7th June										
158	2245	2037:14	-23	189	64	66	77	55	94	34
8th June										
159	2247	1956:18	-23	180	75	58	84	46	99	25
9th June										
160	2249	1915:22	-23	170	83	49	90	37	103	17
10th June										
161	2251	1834:25	-23	161	89	40	95	29	107	9
11th June										
162	2252	0613:57	-23	336					249	2
162	2253	1753:28	-23	151	94	32	99	21	111	1
12th June										
163	2254	0533:01	-23	327					253	9
163	2255	1712:32	-23	142	98	23	104	13		
13th June										
164	2256	0452:05	-23	317			248	-0	258	17
164	2257	1631:36	-23	133	103	15	109	5		
14th June										
165	2258	0411:08	-23	308			252	7	262	26
165	2259	1550:40	-23	123	107	7	113	-2		
15th June										
166	2260	0330:11	-23	299	251	4	257	14	266	34
166	2261	1509:44	-23	114	112	-0				
16th June										
167	2262	0249:15	-23	289	255	12	262	22	271	43
17th June										
168	2264	0208:19	-23	280	260	19	267	31	277	52
18th June										
169	2266	0127:23	-23	270	265	28	272	39	285	61
19th June										
170	2268	0046:27	-23	261	270	36	279	48	298	69
20th June										
171	2270	0005:31	-23	252	275	45	287	56	323	77
171	2272	2324:33	-23	242	282	53	298	64	11	79
21st June										
172	2274	2243:37	-22	233	292	62	318	71	50	74
22nd June										
173	2276	2202:41	-22	223	308	70	352	75	68	66
23rd June										
174	2278	2121:45	-22	214	337	75	30	74	78	57
24th June										
175	2280	2040:49	-22	205	19	76	54	67	85	48
25th June										
176	2282	1959:53	-22	195	49	70	68	59	90	39
26th June										
177	2284	1918:57	-22	186	66	63	78	51	95	30
27th June										
178	2286	1837:59	-22	176	76	54	84	42	99	22
28th June										
179	2288	1757:03	-22	167	83	45	90	34	103	13
29th June										
180	2290	1716:07	-22	158	89	37	95	25	107	5
30th June										
181	2291	0455:40	-22	333					252	4
181	2292	1635:11	-22	148	94	28	100	17	112	-2

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

INFORMATION NETS

AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685MHz — Summer: 7.064MHz

AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305MHz

AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGMENTS

Material has been received from Bob VK3ZBB, Graham VK5AGR and AMSAT-TELEMAIL.

JAS-1

From AMSAT-TELEMAIL is the latest information on the Japanese (JAMSAT) Amateur Space-craft.

Introduction

JAS-1 is an amateur radio satellite, promoted by JARL as a joint venture with NASDA. NEC constructed *system* units (Space frame, power supply, etc), while JAMSAT, with its selected volunteer JAS-1 project team, designed and built the *mission* units (transponders, telemetry/command and house-keeping micro-computer) and ground support systems.

JAS-1 has been completed and has passed all the necessary tests. It is in a clean room waiting for the launch, currently scheduled for August 1986.

The outline of the unique satellite is explained in the following.

Many thanks to Harold Price NK6K, for his assistance in the preparation of this article.

N6MBM/JA2PKI,
Tak Okamoto,
191 Pinestone,
Irvine, CA 92714

JAS-1 Mission Objectives

1 JAS-1 will provide reliable world-wide amateur radio communications.
2 JAS-1 will enable radio amateurs to study tracking and command techniques.
3 JAS-1 will offer an in-space *proving ground* for radio amateur developed and built transponders and sub-systems.
4 JAS-1 will provide NASDA an opportunity to carry out a *multi-payload* launch using their new *H-1* launcher. (NASDA has never engaged in a multi-payload launch, thus the JAS-1 project will offer NASDA an excellent opportunity by providing them with an active payload having its own telemetry-beacon and transponder for ranging).

Form and General Dimensions

The space-craft takes the form of a 26-facet polyhedron, which measures 400 x 400 x 470 mm and weighs 50 kg.

Launch and Orbit

JAS-1 will be launched into a circular low-earth orbit, which will be non-sun synchronous and non-polar.

Launch Vehicle	H-1 two stage rocket
Launch Number	Test Flight # 1
Launch Site	Tanegashima Island, Japan
Launch Date	August 1986
Estimated Inclination	50 degrees
Estimated Altitude	1500 km
Estimated Period	120 minutes
Estimated window per	20 minutes/pass

OSCAR-10 APOGEES
JULY 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st July										
182	2293	0414:42	-22	323					256	11
182	2294	1554:15	-22	139	99	20	104	9		
2nd July										
183	2295	0333:46	-22	314			250	1	260	20
183	2296	1513:19	-22	129	103	12	109	2		
3rd July										
184	2297	0252:50	-22	305	249	-1	255	9	265	28
184	2298	1432:23	-22	120	108	4				
4th July										
185	2299	0211:54	-22	295	254	6	260	17	270	37
5th July										
186	2301	0130:58	-22	286	258	14	265	25	275	45
6th July										
187	2303	0050:02	-21	277	263	22	270	33	232	54
7th July										
188	2305	0009:06	-21	267	268	30	276	41	292	63
188	2307	2328:08	-21	258	273	38	283	50	308	71
8th July										
189	2309	2247:12	-21	248	280	47	293	58	340	77
9th July										
190	2311	2206:16	-21	239	288	56	307	66	25	76
10th July										
191	2313	2125:20	-21	229	300	64	330	72	54	70
11th July										
192	2315	2044:24	-21	220	319	71	5	74	69	62
12th July										
193	2317	2003:28	-21	211	352	75	37	70	78	53
13th July										
194	2319	1922:32	-21	201	29	73	57	64	85	44
14th July										
195	2321	1841:36	-21	192	53	67	70	56	90	35

Estimated passes per day — Eight passes/day

Designed Life
Estimated lifetime is three years.

Special Features of JAS-1
JAS-1 carries two separate mode J transponders. One is a linear transponder, and the other is a digital *store-and- forward* transponder mainly for non-real-time communication between stations located in different time zones.

The reasons for selecting mode J for this first Japanese amateur radio communications satellite are:

It is becoming increasingly difficult to use 145 MHz for a satellite downlink because of man-made electrical noise and other interference.

The planners of JAS-1 wanted to provide a successor to AMSAT OSCAR-8's mode J, which was originally developed by JAMSAT's engineering team back in 1976.

435 MHz is much quieter than 145 MHz as a downlink band, it is comparatively free from man-made noise and sky-temperature effects. The digital transponder will provide error-free *information exchange.*

Transponders
The linear transponder = mode JA:

The passband will be 100 kHz wide. The transponder will have an output of one watt PEP. Ground stations will need an uplink power of 100 watts EIRP. The sidebands will be reversed, ie the uplink is LSB; the downlink is USB. There will be a 100 mW CW beacon switchable to PSK when needed.

Uplink pass band: 145.900 MHz — 146.000 MHz
Downlink pass band: 435.800 MHz — 435.900 MHz
Beacon frequency: 435.795 MHz
Translate frequency: 581.800 MHz

The digital transponder = mode JD:

There will be four 145 MHz band input channels using Manchester coded FM for the uplink. Ground stations will need 100 watts EIRP. There will be one downlink channel in the 435 MHz band using PSK, the output will be one watt RMS. Channels are:
Uplink channel 1: 145.850 MHz
Uplink channel 2: 145.870 MHz
Uplink channel 3: 145.890 MHz
Uplink channel 4: 145.910 MHz
Downlink channel: 435.910 MHz

The data format is HDLC. The protocol is AX.25 Level 2 Version 2. The data transfer rate is 1200 BPS for both uplink and downlink.

The reasons for not using Bell-202 type FSK modulation are:
To reduce the parts count onboard JAS-1. Using Manchester coded FM for uplink reduces JAS-1's onboard decoder chip count by 16.
To improve the downlink margins. Due to JAS-1's tight power budget, only one watt is generated by the downlink transmitter. A more efficient modulation scheme like PSK is required.

JAS-1 will be a store and forward system but not a real time digipeater. Digipeating is not an effective use of a low orbit satellite such as JAS-1, which has a limited communication foot-print and visibility time.

JAS-1 has four uplink channels for one downlink channel. This is because the difference of channel efficiency between uplink and downlink. An uplink channel is shared by several ground users. Since the ground users cannot hear each other, and are listening to the downlink channel anyway, the uplinks are subject to packet collisions. This scheme is called Pure ALOHA, *and is known to have a theoretical maximum channel throughput of 18.4 percent. The JAS-1 downlink is 100 percent efficient, since only JAS-1 transmits there. To balance capacity, as well as add redundancy, four uplink channels are used. The combined uplink efficiency is then 4 * 18.4 percent or 76 percent. The remaining downlink time is used for general messages and telemetry data.*

JAS-1 will accept a connect from only one station at a time with the software scheduled for initial use. Multiple connections will be supported in subsequent software updates. General packet operation is scheduled to begin in November 1986.

Digital Hardware
The micro-processor is a MIL-STD-883B screened NSC-800 running with a 1.6 MHz clock. This is the only processor on board. It controls the digital transponder and also acts as an Integrated Housekeeping Unit (IHU). The on-board memory has a 1.5 MB physical storage capacity. 48 chips of NMOS 256k DRAMs are used. A hardware based error-detection/correction circuit is incorporated to protect the entire 1.5 MB and provide a one MB error-free memory area. The system program occupies some 32 kB, the rest is used for message storage.

The memory unit is physically divided into four identical 256 kB memory cards, any one of which can be assigned as the system area. Up to three cards can be turned off. This design provides system redundancy and allows command stations to control power consumption without total loss of service.

JAS-1 has five hardware HDLC controllers. Four of them are for the uplink channels and one is for the downlink channel. In total, these controllers consist of some 140 CMOS MSIs, yet their power consumption is less than that of a single NMOS LSI HDLC controller like WD-1933. JAS-1 does not have any ROM but has simple hardware boot-strap-circuit instead. This design is to increase system flexibility and reliability.

Power System
25 of JAS-1's 26 faces are covered with a total of 979 pieces of solar cells. They will generate 8.5 watts of power at the beginning of life.

JAS-1 employs 11 Ni-cad battery cells with a capacity of six amp-hours. These supply 14 volts average to JAS-1's main power buss. The 14 volts is converted and regulated to +10, +5 and -5 volts.

Antenna System
JAS-1 has three antennas. Two-metre reception antenna; slant quarter-wave mono-pole isotropic 70 cm transmission antenna with -4 dBi gain; Mode-JA: Slant Turnstile LHCP +Z axis +3 dBi gain and Mode-JD: Slant Turnstile RHCP -Z axis +3 dBi gain.

Attitude Control
Forced shaking using the earth's geomagnetic field. JAS-1 has two 1 ATm sq permanent magnets in its Z axis.

Telemetry
Analog system telemetry has 12 analog channels and 33 system status flags. This telemetry can be sent without the help of the NSC800 micro-processor and will be turned on automatically by the separation from the H-1 launcher.

The telemetry is sent on the 100 mW beacon on 435.795 MHz in CW, switchable to PSK.

Digital system telemetry has 29 analog channels and 33 system status flags. This software driven telemetry can be sent in any format, and can include short text messages. This telemetry can be sent on either the mode JD downlink channel (435.910 MHz) or the mode JA CW beacon (435.795 MHz).

Command
A simple three-channel tele-command system is used for global control; functions, eg JA transponder *ON/OFF*, JD transponder *ON/OFF*, and independent *ON/OFF* of the A-0 beacon. An additional 37 channels are available mainly for controlling the digital transponder.

On-board command from the NSC-800 is also available.

Ground Stations
Mode-JA
A ground station set-up which was used for AMSAT OSCAR-8 mode-J can be used for JAS-1 mode-JA. A station with a 10 watt two- metre SSB transmitter and a 10 dBi beam for uplink; and a 70 cm receiver (with low NF) with a 15 dBi beam for downlink; should be adequate for this job.
Mode-JD
In addition to the mode-JA set-up, FM mode is required for the two-metre transmitter.

Since JAS-1 uses the standard AX.25 protocol and 1200 BPS data rate, ground stations will be able to use a TAPR-style TNC, a two metre FM transmitter and a 70cm receiver without modification.

The JAS-1 modem, a special interface board,

will be made available containing the Manchester modulator and an audio PSK demodulator allowing connection to the *modem disconnect* connector of a TAPR-style TNC. The modem also connects to the audio input and PTT of the two-metre FM transmitter and to the audio output and frequency control (option) of a 70 cm SSB receiver.

Although JAS-1 will be available to Individual access, the general amateur community will benefit from *JAS-1 gateways*. Messages relayed through gateways can be sent world-wide and is as easy as sending messages to distant stations via a W0RLI HF gateway.

Outline of Project History/Schedule

November 1982	Freezing of conceptual/ preliminary design
December 1982	Preliminary design
April 1983	Detail design
— June 1984	Engineering modules integration and test ground support system integration
July — December 1984	Flight model # 1 integration and EIC/MIC
January — March 1985	Flight model # 1 general test
January — August 1985	Flight model # 2 integration and EIC/MIC
August — November 1985	Flight model # 2 general test
November 1985	Software development

AMSAT-AUSTRALIA NEWSLETTER

Graham VK5AGR, the National Co-ordinator of AMSAT-Australia is now producing a monthly newsletter containing updated satellite news, orbital predictions, keplerian data and operating hints and techniques. The objective of the newsletter is to keep the amateur populous informed on the latest information available and to realise funds for the funding of projects or the purchase of an item/s of hardware for a future amateur satellite project, eg Phase 3C, Phase 4 or whatever. The cost of the Newsletter is $15 and cheques made payable to WIA (SA Division), should be forwarded to Graham VK5AGR, QTHR.

To date the Newsletter has been a resounding success within Australia and now comments from overseas amateurs, who have received copies from friends in Australia, indicate that they would like something similar in their own countries.

The Newsletter is basically an eight-page compendium of the nitty-gritties that are relevant in the short-term, items that are out-of-date when printed in this column, and to date it has included some small computer programs specifically for satellite determination, the latest telemetry blocks from OSCAR-10 and OSCARs 9 and 11.

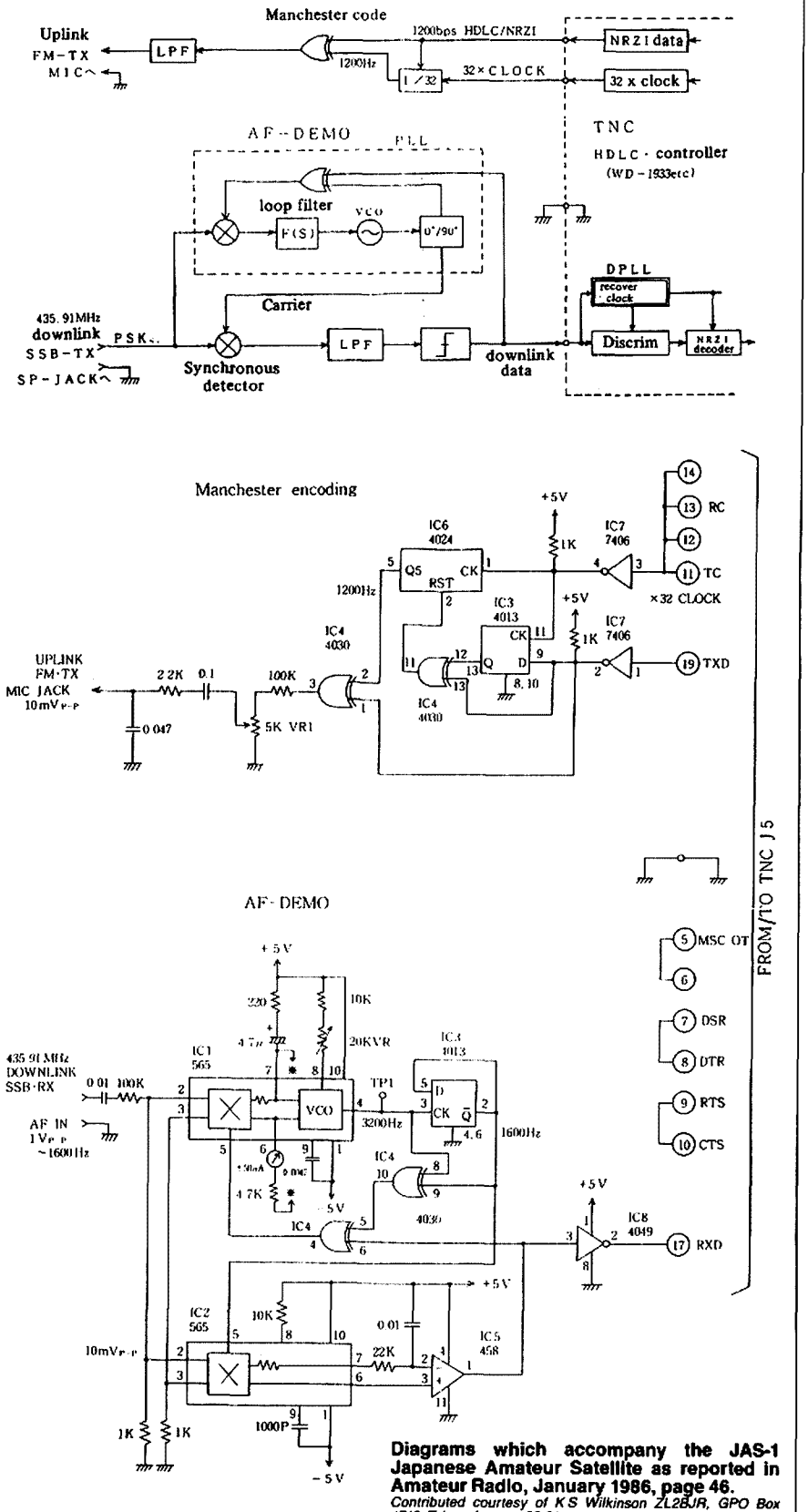
If you are at all interested in satellite communication, this Newsletter is a must.

AMSAT-AUSTRALIA DONATION TO PHASE-3 PROGRAM

Following the success story for 1985 that the AMSAT-Australia Newsletter has been, Graham VK5AGR, recently forwarded a cheque to AMSAT-DL for an amount of $5000, as a donation towards the Phase-3 Program. The $5000 was made up by $3000 from AMSAT-Australia Newsletter Subscriptions, plus donations from the Software Service and proceeds from the PC-1246 Pocket Computer Sales, supplemented by a $2000 donation by the WIA (SA Division), being a significant part of the profits of the 400 VK5 two-metre pre-amplifiers that were marketed by the Equipment Supplies Committee of the SA Division. A large percentage of these pre-amplifiers were purchased by listeners to, and operators of OSCAR-10. This sizable donation is a credit to the untiring efforts of Graham VK5AGR, to whom we are all heavily indebted.

PHASE-3C LAUNCH INFORMATION

The current launch date for Phase-3C is 21st September 1986. To keep all relatively informed on the latest developments of assembly and integration, AMSAT-USA are loading weekly bulletins to AMSAT-TELEMAIL. The bulletins would be significantly out-of-date if used in this column, due to publishing lead-times, however the information is diseminated each week during the AMSAT-Australia Sunday Evening Net. To give an idea of what information is being uploaded to the



Diagrams which accompany the JAS-1 Japanese Amateur Satellite as reported in Amateur Radio, January 1986, page 46.

Contributed courtesy of K S Wilkinson ZL2BJR, GPO Box 1748, Tokyo, Japan, 100-91.

bulletin board, Status Report Number 3, dated 3rd March follows.

The AMSAT-DL team of Werner Haas DJ5KQ and Hanspeter Kuhlen DK1YQ, spent the weekend at the AMSAT laboratory in Golden, Colorado.

Purpose of their trip was to exchange information, particularly for the RUDAK experiment, as well as other matters.

DK1YQ also met with a TAPR representative on Sunday. 16 mm and photo documentation of the construction activities and the team will return to Germany on 3rd March.

The RF Power Amplifier module will be slightly larger than projected. As a result the mounting points on the stringers are no longer valid, and new ones are being made to accommodate the changed dimensions.

The Arm Safe Plug has been pre-wired and is installed.

The Export Licence Application forms were not received by W3GEY prior to the weekend. The originals are complete and the entire file with all needed copies will be in his hands in a couple of days.

The Main Battery Pack was wired and the battery case was assembled and closed. The main battery is now mounted in the spacecraft, but will likely be removed one more time to allow installation of the last mounting screw for the fuel tank.

No progress was made on mounting the Helium Bottle Bracket. That awaits the manufacture of additional mounting parts. An alternative mounting plan has been decided upon.

A milestone of sorts has been achieved. The Main Fuel Tank has been mounted and all mounting ascrews except one have been installed. That will require temporary removal of the main battery as noted above. The fit of the Main Tank was unusually good and the installation was relatively routine. The reaction from W3GEY was *"Something must be wrong . . . that was too easy."* Those familiar with the build of the two prior Phase III satellites will remember that the nylon spacers which mount between the tank and the centre core of the spacecraft had to be of various different thickness. In the present instance all the nylon spacers are identical.

The *Thermal-Vac* schedule *remains* unchanged. Presently a feed-through connector for the Vacuum chamber is being sought and hopefully will be promptly located. There Is at least a chance that the Vibration Test may also be done at the Martin-Marietta facility. That question Is presently undecided.

Again, as in the past, the contests of this report should be made available to Packet and Bulletin Board Systems.

de WB0RLY . . . thanks to TELEMAIL

SATELLITE ACTIVITY FOR PERIOD 1ST TO 28TH FEBRUARY 1986

LAUNCHES

The following launching announcements have been received:

1986-010A	PRC-18	Feb 01	*China*
1966-011A	Cosmos 1729	Feb 01	*USSR*
1986-012A	Cosmos 1730	Feb 04	*USSR*
1968-013A	Cosmos 1731	Feb 07	*USSR*
1988-014A	USA-15	Feb 09	*USA*
1986-014E	USA-16	Feb 09	*USA*
1986-014F	USA-17	Feb 09	*USA*
1986-014H	USA-18	Feb 09	*USA*
1986-015A	Cosmos 1732	Feb 11	*USSR*
1986-016A	BS-2B	Feb 12	*Japan*
1986-017A	MIR	Feb 19	*USSR*
1986-018A	Cosmos 1733	Feb 19	*USSR*
1986-019A	Spot-1	Feb 22	*France*
1986-019B	Viking	Feb 22	*Sweden*
1986-020A	Cosmos 1734	Feb 27	*USSR*
1986-021A	Cosmos 1735	Feb 27	*USSR*

RETURNS

During the period, 52 objects decayed, including the following satellites:

1985-112A	Cosmos 1706	Feb 09
1985-121A	Cosmos 1714	Feb 27
1986-009A	Cosmos 1728	Feb 11
1986-012A	Cosmos 1730	Feb 13

GENERAL

The Japanese Broadcasting Satellite 2B (BS-2B) was launched from the Tanegashima Space Centre and had tentative orbit elements of Apogee 36322 km, perigee 196 km, Inclination 28.5 degrees and period 641 minutes. Transmitting frequency and power were 2.28072 GHz and 1.3 watts.

As at 18th February 1986, 1943 UTC, ATS 1 was located at 56.310 degrees west with inclination 11.983 degrees.

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

This article has arisen from discussion with, and comment from, several amateurs with many years experience, and from Ideas raised in print and at meetings.

We have long been bombarded with the opinion that the main need of our hobby, or the WIA (or probably any club or association with which we are involved), is a *strong infusion of young blood.*

Comments abound on both sides:

— the management is too old, or out of date, set in their ways, unaware of new developments, unwilling to accept new ideas.

— a young recruit is more value than an old recruit.

— the young are vigorous, enthusiastic, prepared to work, and up with modern technology.

— the old have the hindsight of experience.

— we must maintain and increase the number of people who enjoy our hobby

— if our members drop we lose our lobbying power and privileges.

— change is necessary for growth.

— the present system is okay, why change it?

— amateur radio is such a wonderful hobby that more people should be persuaded to join.

Inevitably, the discussion concludes that we should be recruiting from the youth, but without any clear plan as to means or direction.

The Wireless Institute, in its 75 years, has experienced generally steady growth apart from the short bursts of rapid growth due to the post-war availability of cheap disposals gear and the more obvious period of the CB boom.

It is unlikely that either of these events will be repeated, so if, repeat if, we wish to increase the numbers of amateurs, other more active recruitment techniques must be considered.

It has been suggested that the computer boom could provide recruits. Certainly this is a field where the interest of young people is very high, but the link between computers and radio is much more tenuous than that between CB and amateur radio. It is not likely to interest young people in the technical aspects of radio.

Statistics recently published claim that our major growth is from the middle-aged or retired section of the population. Perhaps we should admit that this is where much of our future lies. This group has the time and resources to be able to make a reasonably long term commitment to the hobby and to the WIA.

They also are probably the group with most ability to *sell* the hobby to young people. Even today, much of our *culture* is passed from grandparents to grandchildren, direct.

A major part of the amateur tradition is the help extended to the newcomer by the experienced operator. (Note that this does not necessarily mean the old helping the young). It is a shame that so often the help and encouragement offered is acknowledged only in the column headed *Silent Keys!*

So, if you have enjoyed someone's assistance, tell them so, and be prepared to reciprocate by in turn assisting a new recruit.

If you believe we need to spread the message about radio, have a go at it yourself.

I do not personally believe that any one group is a better *target* than any other, but you may be able to apply your efforts more towards one particular group — the young, the old, the disabled, or even the female!

More importantly, if you come up with a good idea or technique, please be prepared to share it. Let me know about it, so I can pass it on. Many are only waiting for a few hints.

73, Brenda VK3KT.

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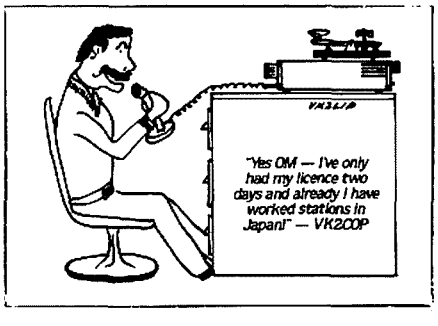

Magazine Review

Roy Hartkopf, VK3AOH
34 Toolangi Road, Alphington, Vic 3078

(G) General : (C) Constructional : (P) Practical without detailed constructional information : (T) Theoretical : (N) Of particular interest to the Novice : (X) Computer Program

RADIO COMMUNICATION March 1986 — Gamma Matching Towers and Masts (P)

HAM RADIO January 1986 — Frequency and Level Standard (C N). Calibrated S Meter. Coaxial Stub Filters (G N)

RADIO (Indian Radio Societies) May 1985 — General Information on amateur radio in India. Regulations, Conferences, etc. (G)

73 Magazine December 1985 — Cellular Radio (G). 1985 Index.

VHF COMMUNICATIONS 3/1985 — New English Translator Available Colin Brock. Magazine now resumed. 70 cm Helical Antenna (P). Crystal Controlled Source for 10 MHz. (C). PCB — Integrated Coaxial Tuned Circuit (P).

CO-TV No 133 February 1986 — 24 cm FM-TV Transmitter (P). 70 cm Coaxial Collinear Antenna. (C)

WHAT'S NEW IN ELECTRONICS January 1986, February 1986 — Trade and General Information about Test Equipment, Components, Hardware, etc newly available. Includes Educational Material.

73 MAGAZINE February 1986 — Scanning for the TR 2400 (C). RIT for the FV 101.

QST March 1986 — Weather Maps on Dot Matrix Printer (P X). Mountaintopping (G). CW Transmitter for 902 MHz (C).

WORLDRADIO March 1986 — Two Views on Cellular Radio. New Office Bearers for YLRL. FCC Highlights. General amateur radio News and Views.

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THOUGHT FOR THE MONTH

Anticipating change is to benefit from it.

Club Corner

VK3RVL — two-metre repeater

The Robinvale two-metre repeater, VK3RVL, is situated atop the Robinvale wheat silo, adjacent to the town centre. It was first placed on-air under test in November 1984, at the residence of VK3YEJ, where construction took place most Monday nights and whenever time permitted.

The construction crew consisted of Graeme VK3YEJ (who's small, but well-equipped shack was used as a work-shop), Roger VK3KIY (who donated his pride-and-joy power supply), Geoff (an amateur when he can find the time), and Mark VK3KYG.

VK3RVL was placed in its final position on the silo in September last year. Many may think it was a long time under test, but it was no easy task getting the unit and the installers to the top of the silo so it was necessary to make sure it was in top operating condition prior to final installation.

The equipment consists of an STC MTR 151, with a FET preamplifier in the receive line. The cabinet also houses the power supply, control unit, cavities and battery, in case of power failure. There is one cavity in the receive line feeding a Hoxin 7.5 dB antenna and two cavities in the transmit line feeding a Hoxin 6 dB antenna. Both antennas are mounted on the same mast with about three metres vertical separation, with an extra set of radials between the transmit and receive antennas.

The repeater is on channel 7050 plus shift; time five minutes; mode FM; power 40 watts ERP; range 70 km range approximately; height 115 metres ASL.

The repeater is monitored most waking hours.

Contributed by Mark Harris VK3KYG

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AUSTRALIAN AMATEUR PACKET RADIO ASSOCIATION

The 12 months since the formation of this group has been one filled with activity and growth — membership has grown from 12, in the initial stages, to 130 now. This gives some indication of the rapid increase in interest in this mode.

At the first annual general meeting, it was decided to change the name of the group from the TAPR User's Group to the Australian Amateur Packet Radio Association.

As interest was primarily in AX.25 protocol and equipment was becoming available from other than TAPR, it was felt a less specific name was desirable. Indeed, the group are now supplying a system designed by Chris VK4BCM, which uses a simple modem and a Commodore 64 computer.

A digipeater, VK2RPH, has been installed at Hornsby, on 147.575 MHz, which is providing access between the Sydney and Newcastle local areas.

Wollongong-Sydney-Newcastle-Brisbane Link-up

At Easter, John VK2YGV and Norm VK2TOP from Tamworth set up on mountain tops in Northern New South Wales and were able to provide a link between Newcastle and Brisbane. Stations in Sydney and Wollongong were able to work into Brisbane for the first time. This is believed to be a record for packet linking in Australia, as the distance is of the order of 600 miles (965 km).

Packet Boards

The association is, at present, supplying the TAPR TNC2 boards as bare-boards with EPROMS and a system manual, for $125 including postage. This board, when completed, costs a total of approximately $270. All components are available locally.

Commodore C64, 128, and SX.64 owners — The packet program written by VK4BCM is currently being distributed by the association. This package comprises a disc with the program and some utilities, a bare printed circuit board and manual for assembly and operation. The printed circuit board is for a simple modem using the EXAR chips 2206 and 2211. This board is connected to the user port of a Commodore computer without using the Commodore RS232 interface. This program provides all the usual facilities of the TAPR TNCs, digipeating, beacons, file transfers, etc. The price of this package is $48. Parts to complete the modem costs approximately $30. Software updates will be announced through Digipeat, the Club's Newsletter/ Inquiries and orders for these packet units can be made to the Secretary AAPRA, 59 Westbrook Avenue, Wahroonga, NSW. 2076.

Technical inquiries can be made to Barry White VK2AAB on (02) 487 1428, or in Sydney on repeater 7250.

Membership of the Association is $6 per year.

Bulletin Boards

At present, there are a number of AX.25 packet bulletin boards operating in Sydney and Newcastle.

These PBBs are all on 147.575 MHz. In the future, some rationalisation must take place. There are two schools of thought, one has it that there should be one PBB for the whole network and the other has it that there should be one for each major area. In our present context, that would mean one in Sydney, one in Newcastle, and one in Canberra.

They will not achieve their full potential until unattended operation is possible, hopefully sometime in the near future.

The association would like to hear comments on this matter from anyone interested.

Contributed by Barry White VK2AAB.

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OLDEST RADIO CLUB REFORMS

The Waverley Amateur Radio Society meeting was held on 8th April, 1986, at the Edgecliff Scout Hall, with the aim to re-activate the oldest amateur radio club in Australia. The society was originally founded in March 1919, with a transmitting and receiving licence issued by the then Department of the Navy in August 1920. This licence has now been held continuously for over 65-years. Early experimenters in amateur radio, members of the Waverley Society, started broadcasts from the St Albans Hall in Coogee, and St Lukes in Clovelly during 1921 and 1922, which lead to the founding of the present day 2BL and 2FC radio stations. Experiments also took place with television, the licensing authorities prohibiting commercials in 1935.

An enthusiastic group of 27 attended, with interest expressed by more via letters and telephone calls. A brief history of the Society was given, with photographs loaned by the original 1920 sponsor of the radio licence, Gordon Thompson VK2AVT, and copies of the original licence were displayed around other historical documents. A steering committee was formed — Manfred Meyer VK2RV, Collin Mack VK2EAZ, Eric Van De Weyer VK2KUR, and Duane Foster VK2VE — who will act as an interim executive until elections can be held. A general discussion followed with numerous valuable suggestions coming from the floor to assist the re-organisation of the Society.

For those interested in electronics, computers, or amateur radio, contact either Duane or Eric, at PO Box 126, Randwick, NSW. 2031.

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DEVIL NEWS from the NW Branch

The April meeting saw an attendance of 20, including one new member, Malcolm VK7NCA. Welcome Malcolm. The minutes of the previous meeting were read and accepted, and out of them it was decided that the 10th June should be a special meeting that the ladies could attend. At this meeting, Camp Quality will be spoken about, and as some members will have to attend the Camp for one-week to provide the communications, it is thought the ladies should know in advance the time it will take up and the details involved.

The Club Roster for the Sunday Broadcasts was discussed and a good response was received from the membership to continue doing the relays for all bands. The Club appreciates the willing effort and hard work done by these dedicated members.

The Gong Award was to have been awarded to Max VK7KY. Max was attempting to explain to a visitor how the repeater operates and explained that if an operator spoke for more than three-minutes the repeater would *GONG*-out. On trying to stress this point, that is exactly what happened — it gonged out. This provided an excellent demonstration. If Frank VK7ZFH had not forgotten to take the award to the meeting it would have been presented to Max, however Frank received it again for another month for his *bad memory!*

The President, Bob VK7KAB, thanked members for being on 80 metres to speak to a group of high school students at his QTH, thus making a good night for the students. Bob is attempting to get a station operational at Savage River High School and even the teachers were impressed with the contacts he made during the night. He is also trying to get a station operational at Wynyard High School and would like to hear from anybody who would be willing to assist.

One of the members now has a new operator in his shack — or should it be a second operator? Jack VK7WJ received a small Easter present — a kitten. It was wrapped in Easter paper and presented to him by a charming young lady, his adopted grand-daughter. Jack has had to cover quite a few things in the house and the shack but he will not be parting with the present for quite a long time to come.

We have been told that when we do the communications for the horse trials next year, we will have to be on our best behaviour as HRH Princess Ann will be competing. (We may have to wear a collar and tie for the occasion!).

The horse trials, held at Wynyard, proved to be a successful day. The operators provided emergency communications and score transfer for the event and was the biggest event covered by the Club to this date.

The course has 31 fences for the senior competitors to jump and the novice competitors had 26 fences to jump. There were 12 operators used, 11 at field stations with one at a central base station receiving messages from the field stations.

Members who participated were VK7s ZPT; ZHA; ZBT; EG; AX; WL; ZAP; OL; DC; WJ; KDR and ZRD.

Thanks to John VK7ZPT, WICEN Co-ordinator, for this report.

The Billycart Derby, that was held at Lillico Straight was also a great success, with plenty of spills and thrills for the competitors. Thanks to the operators who participated at both events.

The General Meeting concluded at 9pm, allowing time for the guest speaker to complete the evening. Shane Cathcart gave an interesting talk about the State Library. It has 420 000 books, seven mobile units, and a staff of 600. This is one of the best systems in Australia, with 14 branches in the Hellyer region alone.

There is more to this library than meets the eye. A very good example was given to Florien who asked for the name of a certain book and was surprised to know that he could obtain it. Also, Syd VK7SF had a problem repairing tape-recorders and used to borrow a book from the library until it disappeared from the shelf. He asked if it would be possible to see if they still had it and in a very short time Shane found that it was in Hobart and promised to have it returned for Syd.

Many other facilities available to the public were discussed, concluding with a very good item about cars.

Contributed by Max Hardstaff VK7KY

LIFE MEMBERS

Life membership of the Coffs Harbour and District Amateur Radio Club was awarded to Rick Fletcher VK2BKV and Max Francis VK2BMK, in recognition and appreciation of years of service to the club.

At a special meeting, held on 19th March 1986, members voted unanimously in favour of this motion. Congratulations Rick and Max.

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A R Showcase

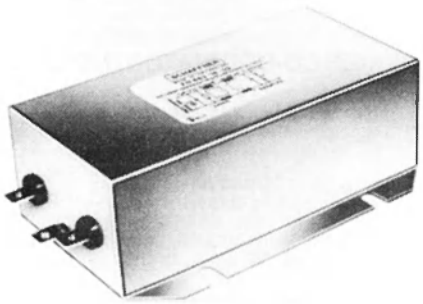
POWER-LINE FILTERS FROM WESTINGHOUSE SYSTEMS

FN-346 — FILTER WITH HIGH ATTENUATION

This new power line filter is designed for currents of 1.6; 2.5; 6 and 10 amps.

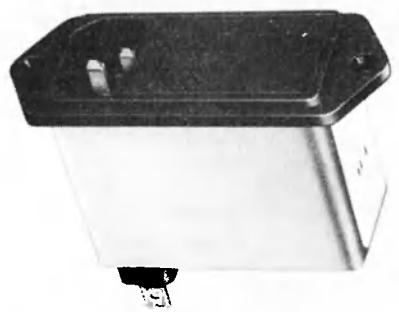
Its excellent attenuation characteristics are similar to those of a two-stage power-line filter. The FN-346 is suited for the suppression of common mode and differential mode interference elimination as well as for the interference elimination of switching mode power supplies and clicks. The power-line filter is equipped with an IEC plug, on the secondary side alternatively with fast-on 6.3 x 0.8 or flex wires.

TWO-STAGE FILTER FOR HIGH CURRENTS



The FN-683 and 684 are designed for currents of 10; 16; 25 and 36 amps. The very good common mode and differential mode attenuation characteristics are effective at a frequency of 10 kHz (frequency range 10 kHz to 300 MHz). These filters are suited for the central computer units and for high current switching mode power supplies. The excellent cost performance ratio makes this product very attractive.

FILTERS WITH IEC-PLUG, FUSES AND EARTH LINE CHOKE



These filters are equipped with two different fuse-holders: type FN-291 with fuse-holder for one fuse; type FN-292 with fuse-holder for two fuses. The fuse-holders can be equipped alternatively with 6.3 x 32 mm or 5 x 20 mm fuses.

They are especially suitable for use in electronic equipment such as office machines, calculators and measuring instruments, due to a good common and differential mode behaviour in the range of 150 kHz to 300 MHz. For the application in peripheral equipment, both series are available with an earth line choke, type FN-291E and FN-292E.

Further enquiries about these products should be directed to Westinghouse Systems, PO Box 267, Williamstown, Vic. 3016. Phone: (03) 397 1033.

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CB EQUIPMENT

GFS Electronic Imports recently announced their intention to further enhance their extensive range of amateur radio and commercial products by adding Citizens Band equipment to the inventory.

The *highly regarded Electrophone* brand will feature prominently among the 27 MHz and UHF transceivers. Eight years of experience in the amateur and commercial communications field has provided GFS with an expertise that most others selling CB do not have. For example, they are able to advise customers on such subjects as the correct antenna and coaxial cable to use for a particular application.

GFS also have a fully equipped workshop so they may meet the servicing requirements of the CB market including backup service on the products they sell.

In the area of accessories, they stock beams, a range of different low loss coaxial cables, antenna rotators and non-conductive high strength *Debeglass* guy wire.

For further information contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone (03) 873 3777.

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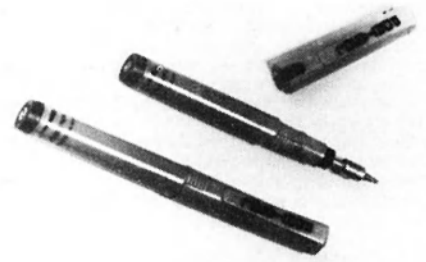
ELECTRONICS SHOW

The 1986 Perth Electronics Show will be held from 31st July to 3rd August 1986 at Perth's Claremont Showgrounds, and will be the largest and most comprehensive consumer electronics and homeware exhibition in Australia and the South East Asian region.

Over 12,000 square metres of exhibition space has been sold in 13 pavilions and most major electronic/electrical companies will be represented.



For further information contact Chris Gulland, PO Box 745, West Perth, WA. 6005, or phone (09) 382 3122.

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PORTABLE SOLDERING IRON

The Portasol is a portable pen-sized soldering iron used by people in the electrical, mechanical and engineering fields.

It is a butane gas powered iron, ignited by a flint ignition in the cap. It has a 10 to 60 watt temperature control and each fill with gas lighter fuel gives 60 minutes of continuous use. The Portasol also comes with three tip sizes and each tip gives 30 hours of use. (Maximum tip temperature is 400 degrees C.

It is the smallest soldering iron available and it can be used in almost all conditions, indoors and out. The design features also include important safety advantages. When the cap is replaced the gas is automatically switched off and when the user is finished with the Portasol there is no need to wait for it to cool, or find a suitable place to rest it as the cap is able to withstand up to 250 degrees. There is little waste or leakage since the user can switch on and off at will. It also take just 20 seconds to reheat, and because it is static free, it is ideal for use with CMOS and other static-sensitive components.

For more information contact Stephen Treble or Don McNeill at DRM Industries on (02) 997 5522, or write to 14 Tengah Crescent, Mona Vale, NSW. 2103.

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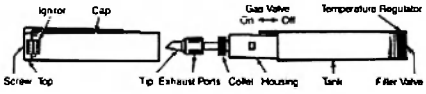

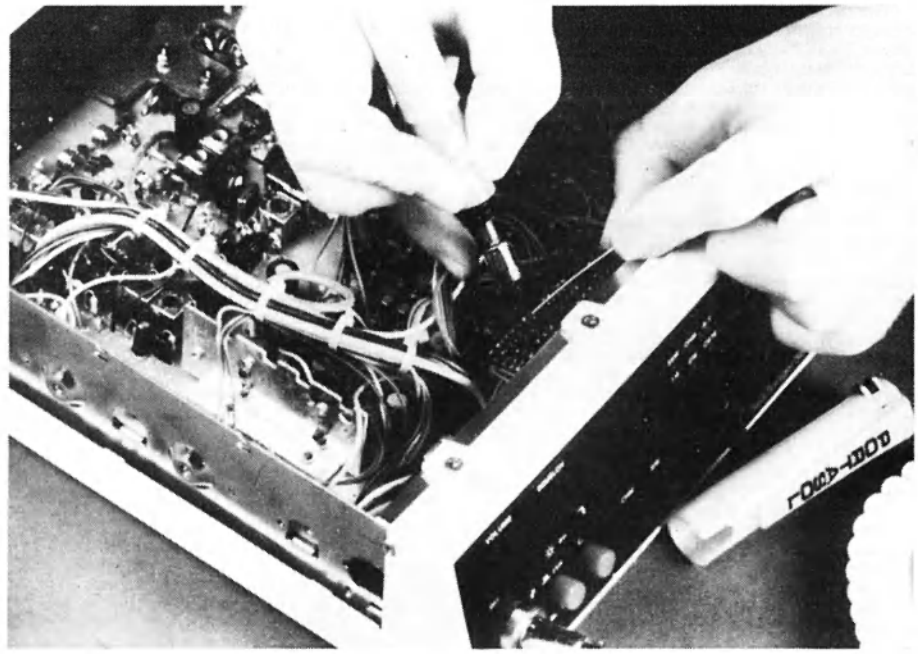

NEW LITERATURE

Analog-Digital Conversion Handbook, a comprehensive guide to conversion lor engineers and scientists, contains 22 chapters and is published by Analog Devices, Inc and Prentice-Hall.

The third edition of this well-known handbook has grown to 700 hard-bound pages, with seven new chapters, bibliography, and index. An easy-to-use table of contents summarises the book's five sections, which range from converter uses in circuits, sub- systems and systems to *Guide for the Troubled* — preventing and curing conversion-system problems.

The section, *A/D and D/A converters*, discusses operation, technologies, architectures, designs and how they are used for best results. A new section, *Converters for Special Applications*, covers conversion for video speeds, synchros and resolvers, high resolution, and wide dynamic ranges — as well as V/F and F/V. A new section entitled, *Related Circuits and Devices;* includes sample-holds, references, switches and multiplexers and DSP ICs.

The book is available from Parameters Pty Ltd, 25-27 Paul Street North, North Ryde, NSW. 2113; or 1064 Centre Road, Oakleigh South, Vic. 3167 to whom all enquiries should be directed.

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LINEAR AMPLIFIER

The Transworld Electronics T500M is an all solid state linear amplifier designed for land or marine mobile operation or for base station use with the optional AC power supply. The amplifier uses a new series of high power RF transistors operating directly from a 12 volt supply source and does not require a power supply for mobile operation. The amplifier draws no standby current and only draws maximum current on voice peaks. This keeps the average current requirements to a level well within the capabilities of modern vehicle generating systems and for the first time makes high power land, air or marine mobile operation a practical reality.

The amplifier is designed for remote control and can be mounted in any convenient location.

It covers the range 2-30 MHz, and the broadband design means there are no tuning adjustments for any frequency in the range. The drive requirements are 60 watts minimum, and the gain of the amplifier is typically 10 dB. This tenfold increase in power output gives a substantial increase in signal strength and does much to compensate for the low efficiency of the mobile antenna. The amplifier is compatible for use with virtually any SSB transceiver with a power output in the range 60-150 watts PEP.

The broadband design means there are no limitations on frequency coverage or number of channels.

Installation is simple. The amplifier is inserted in the coaxial line to the antenna, and the power and control connections are made. The only operational adjustment is to set the exciter ALC to provide the correct drive level.

The T500M is rated for operation over the temperature range .30 to +60 degrees Celsius. The duty cycle is 50 percent transmit/receive at an ambient temperature of 25 degrees Celsius in the SSB and CW modes. The duty cycle should be reduced at higher temperatures. A thermostat on the heat-sink switches the amplifier off if the heat-sink temperature exceeds 75 degrees Celsius.

For Technical Specifications and further information please contact Scalar Distributors Pty Ltd, 20 Shelley Avenue, Kilsyth, Vic. 3137, phone (03) 725 9677 or Sydney (02) 502 2888, Brisbane (07) 395 1188 or (07) 395 1817, Perth (09) 446 9177.

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DOUBLE RIDGE MAGIC TEES

Adams-Russell waveguide Magic Tees are designed to handle extremely high power while maintaining excellent overall performance characteristics over 3:1 bandwidths.

This capability allows Adams-Russell to offer proven designs with measured electrical performance as follows.

WRD650D28 frequency range 6.5-18.2 GHz; VSWR 6.5-7.2 GHz 2.1:1 maximum, 7.2-18.2 GHz 1.5:1; coupling 3.1 ±.3 dB, collinear isolation 14 dB minimum; E-H port isolation 30 dB minimum.
WRD750D24 frequency range 7.5-18.2 GHz; VSWR 1.5:1 maximum; coupling 3.1 ±.3 dB; collinear isolation 14 dB minimum.

E-H port isolation 30 dB minimum; power handling* 50kW peak 1kW CW average.

** Power handling testing has been limited by the availability of high power transmitters. Ultimate levels are yet to be determined.*

Insertion loss (dissipative and reflective) are included in the coupling tolerance.

Mechanically, Magic Tees are supplied in a two inch (50mm) cubic form with cover flanges (clearance or tapped holes with helical inserts available). Gasket grooves can be added to the tee as well as a built-in 50 watt fourth port termination for those who need only three ports.

For further information contact Scalar Distributors Pty Ltd, as above.

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WICEN News

Ted Gabriel VK4YG
WICEN CO-ORDINATOR, REGION ONE
PO Box 245, Ravenshoe, Qld. 4872

CYCLONE WINIFRED

This year's Wet Season in Northern Queensland began quietly enough and appeared as though it would be fairly dry in some inland areas of the cattle country. However, on Wednesday, 29th January, monsoonal activity, about 100 nautical miles (185 km) east of Cooktown began to intensify and the cloud mass, seen by the weather satellite, began to take on the familiar circular pattern of a cyclone, with the barometric pressure falling steadily.

The cyclone, by this time code-named *Winifred*, started moving slowly to the south-east, intensifying as it travelled parallel to the coast-line.

Heavy rain commenced falling over a wide stretch of the North Queensland coast, rivers and streams began to rise, and by evening, the railway line near Babinda was cut by rising flood-waters.

Region One WICEN operators commenced cyclone track plotting, with Alan VK4BAJ, Cairns Area Net Controller, in charge of the VHF stand-by net on the VK4RCA repeater.

Amateurs in areas likely to be affected by the cyclone checked into the net with weather and equipment serviceability reports.

Townsville Region One-A WICEN operators were also alerted, and a HF link was established on 7.080 MHz.

Cyclone track plotting is carried out on large scale charts marked with a latitude and longitude grid, showing the coast-line and main population centres. Since the hourly meteorology department reports broadcast by OTC Coastal and Shipping Radio Stations are used, distances are expressed in nautical miles and wind speeds in knots. (Townsville and Thursday Island Radio Stations transmit cyclone watch messages and gale warnings on 2.201 and 4.428.7 MHz.

On the morning of the 30th, Winifred was located at 15 degrees 10 minutes south and 147 degrees east, with a central pressure of 975 mbs and wind speeds near the centre of 70 knots (130 km/h). Later in the day it became stationary, although intensifying and the pressure had fallen to 970 mbs.

During Friday, she again continued to move slowly parallel to the coast until she was about 100 nautical miles east of Cairns. Winifred then turned south and then later in the day headed ominously south-west towards the coast. At this time the central pressure was 965 mbs and wind gusts were 100 knots (185 km/h).

Region One WICEN remained in contact with coastal amateurs through VK4RCA with more stations checking in during Friday night. Heavy rain was falling in the area between Cairns and Innisfail and local winds were increasing to gale-force.

During Saturday, 1st February, Winifred continued moving slowly towards the coast. With continual rain and increasing wind speed, road and rail traffic was disrupted. Cairns International Airport was closed to traffic and by midday, the barometric pressure had fallen to 960 mbs, with centre wind gusts to 119 knots (220 km/h).

The regional State Emergency Service (SES), which had been on stand-by alert, went into full-activation in all coastal centres and on the Atherton Tablelands. Communication operators, including many amateurs, were then called for duty at their centres, together with rescue crews.

As wind speeds increased, falling trees and flying debris cut power lines, blacking-out the whole area. Fortunately, most SES Centres have generator sets and batteries to maintain communications, however, late Saturday, telephone links in the area also failed throwing an extra load on the radio sections.

The telephone failure was caused by the large microwave dish aerials, on Mount Bellenden Ker being moved off beam-line on their fittings by wind gusts in excess of 135 knots (250 km/h).

It was at this time that the SES requested assistance from WICEN as their VHF and UHF channels were over-loaded with the extra traffic. HF, and SSB frequencies were also fully engaged with local and relay traffic.

Mike VK4AMO, the Cairns Club Liaison Officer, activated the Club Station, VK4HM, ably assisted by Claude VK4KDQ and John VK4VKL.

Message handling commenced when VHF links were set up with Peter VK4BDK, at Innisfail SES Headquarters, Mario VK4MS, in Ingham, and the Townsville Club, VK4WIT, at their SES Headquarters.

High and Dry! A victim of Cyclone Winifred.
Photograph courtesy Innisfail Advocate

Winifred crossed the coast late on Saturday evening south of Innisfail, with the eye passing over Silkwood where a short period of calm was experienced.

Wide-spread structural damage was caused to buildings (particularly older style wooden houses), sugar cane crops were flattened, farm buildings destroyed and roads were flooded or blocked by falling trees. The towns of Milla Milla and Malanda were in the path of the fury and many houses were unroofed and damaged. One man was killed when he was blown off the roof he was attempting to fasten down.

Winifred moved inland in a westerly direction, gradually losing intensity but still accompanied by heavy rain which swept away or damaged bridges on inland roads.

As soon as the wind speed abated, SES rescue crews, assisted by volunteers and Army and Navy units, moved into the disaster area to render assistance to the injured and homeless survivors.

The SES called for volunteers from the Cairns Radio Club with VHF hand-held and mobile units to provide communications for the Army and Navy units.

Club President, Colin VK4EX, together with Mike VK4AMO, Ray VK4BRC and Nick VK4YT moved with the service units whislt John VK4VKL was with the SES team as a driver.

Casualties and injuries were surprisingly light thanks to the swift warnings by Police and SES personnel through local broadcast and television stations before the blackout.

As soon as weather conditions permitted, several injured persons were airlifted to Cairns Base Hospital from the disaster area by the SES and other Helicopters.

The Army unit organised a team of local vehicles to light the Innisfail airstrip so that an RAAF *Hercules* aircraft, loaded with tarpaulins and other urgent supplies, could carry out a night landing.

For the weary radio operators there were many more hours of traffic handling, as relief operations were stepped-up and the mammoth clean-up task began in earnest. Where-abouts and welfare queries from anxious relatives also added to the workload.

Finally, when Telecom workers had restored telephone links, WICEN and many SES Centres were able to close down after a job well-done.

The extent to which amateur radio operators helped to maintain the SES HF Network and provide general WICEN VHF communications during the emergency can be seen from the lists below Some 35 North Queensland amateurs served their communities during Cyclone Winifred and their efforts are a credit to the amateur radio fraternity.

POINTS OF INTEREST TO OPERATORS

In recent years, the SES has acquired more sophisticated radio equipment and established a chain of UHF repeaters along the Queensland coast. However, this has caused problems with the training of communications operators who did not have experience in this new mode. Thus, for some time, amateur radio operators have been involved with SES communications as Group Leaders, Instructors, and operators, particularly in smaller country centres. WICEN, through local clubs with facilities such as VHF repeaters, have been able to provide extra channels.

Also, WICEN being an independent service, has the ability to prepare before the event, keep a cyclone track plot, gather information from operators and be ready to activate a full network when required, whereas the SES is not usually activated until emergencies happen and/or a disaster area is declared.

Cyclones, which are violent rotating windstorms, accompanied by heavy rain and low barometric pressure, cause heavy destruction which is confined mainly to areas on either side of their track. Thus communication centres with VHF repeaters just clear of that track may be able to remain serviceable and be ready to assist after the cyclone has passed.

The Cairns Amateur Radio Club's two metre repeater VK4RCA (channel 6950), is located on Mount Bellenden Ker, which, at an altitude of 5200 feet (1584m), commands a large area of the rugged coastline and tablelands.

This repeater and the SES two-channel UHF repeater remained on air during the entire period, in spite of being subjected to estimated wind-speed gusts between 135 and 170 knots (250 and 300 km/h).

The VK4RCA antenna is fibreglass and, while suffering some surface cracking, is still serviceable. An aluminium Yagi antenna, intended to link with the Townsville repeater VK4RAT, vanished during the blow.

Past experience with antennas at this site has indicated that high wind speeds cause excessive vibration in aluminium elements which results in crystallisation and corrosion, leading to eventual failure under gusty conditions. These points should be considered when designing aerials for mountain-top repeaters.

The CARC is preparing to activate its second two metre repeater, VK4RTA, on channel 6675. This repeater will be situated at Longlands Gap, at the southern end of the Atherton Tablelands. At an altitude of 3770 feet (1150m), it will also cover a wide area, including much of the lonely Kennedy Highway to the Gulf Country. Its ability to back-up VK4RCA in emergencies will be of vital importance to the region.

Tropical *Cyclone Watch* and *Cyclone Warning* messages from the Bureau of Meteorology are issued to the public through local broadcast and television stations and these are expressed in the metric system.

For WICEN operators, and others who may be involved in cyclone track plotting, a table of conversion factors follows:

— kilometres = statute miles x 1.609: statute miles = kilometres x .6213

— kilometres = nautical miles x 1.853: nautical miles = kilometres x .5396

— statute miles = nautical miles x 1.1515: nautical miles = statute miles x .8684

On nautical and plotting charts, one degree of latitude equals 60 nautical miles measured at the location's latitude.

Cyclone watch ad warning messages, plus gale warnings are broadcast from the following Coastal Radio Stations on 2.201 and 4.428.7 MHz (SSB Phone) at the times shown.

Brisbane: VIB 2233; 0318; 0833 UTC
Rockhampton: VIR 2248; 0218; 0633 UTC
Townsville:VIT 2133; 0333; 0748 UTC
Thursday Island: VII 2303; 0248; 0648 UTC

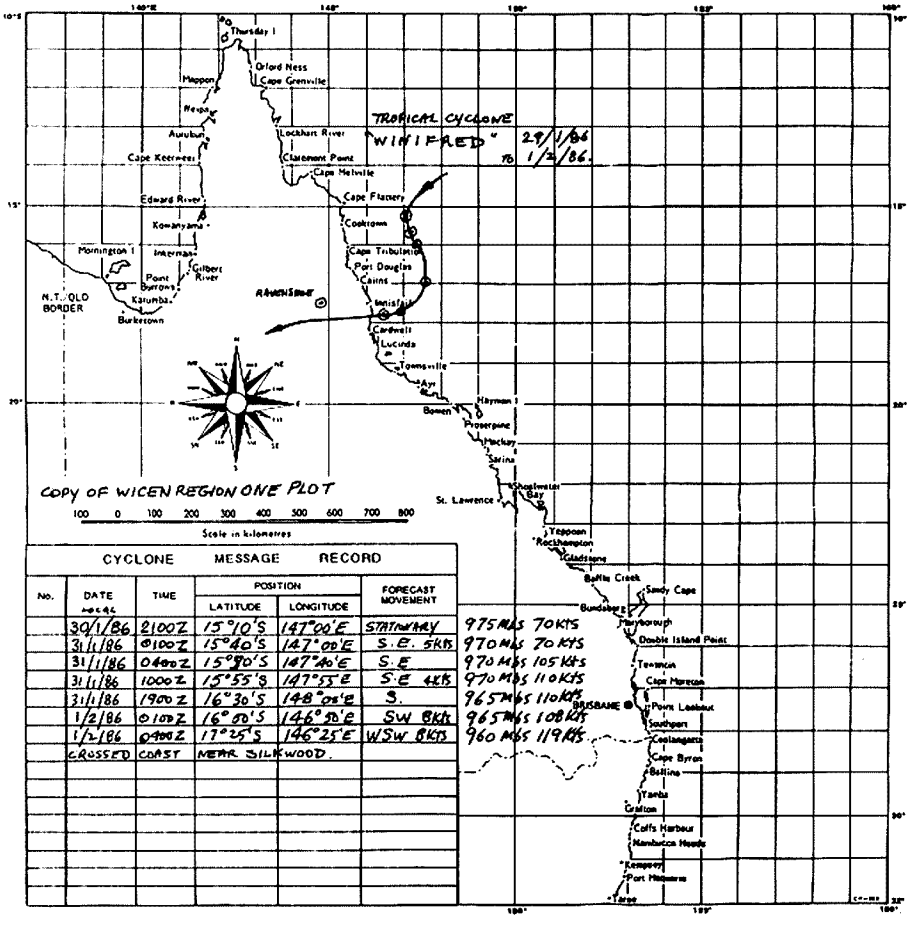
All are 24-hour service except Rockhampton.

For Canberra and Darwin facsimile transmissions refer to Australian notices to mariners, 1/1/86, or the Bureau of Meteorology.

Amateur radio operators involved with the SES were: Mike VK4AMO; Nick VK4YT; and CARC members (Cairns) — Bob VK4WJ; Allan VK4PS; John VK4AFS; and TARC members (Townsville) — Fred VK4MFW (Atherton) — Ted VK4YG; David VK4ADW; John VK4MJH (Ravenshoe/Heberton) — Brian VK4VDC; Terry VK4ATY (Eacham Shire) — Mario VK4MS (Ingham).

WICEN-CARC members involved in disaster area communications were: Alan VK4BAJ; Colin VK4EX; Ray VK4BRC; Albert VK4CL; Gordon VK4AGZ; Wilf VK4ZNZ; John VK4AJE; Peter VK4BDK; Norman VK4FGG; Tony VK4FOX; John VK4SZ; John VK4VKL; Barry VK4VCQ (now VK4FCQ); Claude VK4KDQ; Bill VK4FET and Dale VK4KDM.

CYCLONE TRACKING MAP



No.	DATE	TIME	POSITION LATITUDE	POSITION LONGITUDE	FORECAST MOVEMENT	
	30/1/86	2100Z	15°10'S	147°00'E	STATIONARY	975 MBS 70 KTS
	31/1/86	0100Z	15°40'S	147°00'E	S.E. 5KTS	970 MBS 70 KTS
	31/1/86	0400Z	15°50'S	147°40'E	S.E	970 MBS 105 KTS
	31/1/86	1000Z	15°55'S	147°55'E	S.E 4KTS	970 MBS 110 KTS
	31/1/86	1900Z	16°30'S	148°05'E	S.	965 MBS 110 KTS
	1/2/86	0100Z	16°50'S	146°50'E	SW 8KTS	965 MBS 108 KTS
	1/2/86	0400Z	17°25'S	146°25'E	WSW 8KTS	960 MBS 119 KTS
	CROSSED	COAST	NEAR SILKWOOD.			

CYCLONE MESSAGE RECORD

REFERENCES AND ACKNOWLEDGMENTS

Australian Notices to Mariners: RAN Hydrographic Service
Cyclone Tracking Map: Bureau of Meteorology
Region One WICEN Plan: VK4YG
Photograph: Innisfail Advocate

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MANLY WARRINGAH RADIO SOCIETY

The Annual General Meeting will be held on 9th July 1986, at 7.30pm. See next month's Club Corner for full details.

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VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

The Annual General Meeting was held on 5th April 1986. A report has been given to members via the Broadcast on the 6th April. A written report on the meeting will be included in a later Mini-Bulletin.

There were 645 ballot papers returned for the election. Of these, 25 were informal. Subsequently, a further 30 showed up as a result of late posting. Those elected were as follows:
Mary Jane Cant VK2CMJ; Roger Henley VK2ZIG/NWH; David Horsfall VK2KFU; Peter Jeremy VK2PJ; Tim Mills VK2ZTM; Jeff Pages VK2BYY and Dennis Williams VK2XDW

The meeting opened at 1410 and closed at 1850 hours. The Returning Officer for 1986/87 is Peter O'Connell VK2EMU.

VK2 1986 COUNCIL

The new Divisional Council met on Friday, 11th April and the major office-bearers for 1986-87 were elected as follows:

President	*Peter Jeremy VK2PJ*
Vice-Presidents	*Roger Henley VK2ZIG*
	Tim Mills VK2ZTM
Secretary	*Jeff Pages VK2BYY*
Secretarial Assistant	*Roger Henley VK2ZIG*
Treasurer	*David Thompson VK2BDT*
Assistant Treasurer	*David Horsfall VK2KFU*
Affiliated Clubs Liaison	*Mary Jane Cant VK2CMJ*
Member Services	*Roger Henley VK2ZIG*
Repeater Committee Chairman	*Dennis Williams VK2XDW*
QSL Bureau Liaison	*Dennis Williams VK2XDW*
Dural Property Officer	*Peter Jeremy VK2PJ*
Parramatta Property Officer	*Roger Henley VK2ZIG*
Broadcast Officer	*David Horsfall VK2KFU*
Mini-Bulletin Editor	*Tim Mills VK2ZTM*
New Membership	*Dennis Williams VK2XDW*
Publications	*David Horsfall VK2KFU*

The Education Service, WICEN, Dural, Parramatta and Repeater Committees will be notified in a future Mini-Bulletin.

CLUB INSURANCE

A report on a (possible) *Public Liability Insurance* package has been prepared and distributed to many of the clubs in the State. Copies are available from the Divisional Office.

ACTIVE AGAIN

Waverley ARC (VK2BV) is currently being reformed after a few years of in-activity. It is to cater for those with radio and electronic interests in Sydney's Eastern Suburb.

A reminder that these notes can only cover a small part of the activity in the State. Informed amateurs listen to the Sunday Broadcasts — do you?

NEW MEMBERS

The VK2 Division would like to welcome the following new members who were in the April intake.

S Brighton VK2DSB, Illawong; J W Dargan Assoc, Greenwich; S Dudgeon (Ms) Assoc, Chatswood; D K Findley VK2KDF (Overseas); J J Gerhard VK2TH, Wagga Wagga; L J Gray Assoc, Northbridge; R A Hocking Assoc, Tenambit; C V D King VK2NHL, Botany; J G Lucas VK2CJL, Wahroonga; M Nowicki VK2JMN, Canley Vale; A E Sheppherd VK2EDS, Maroubra; J A Viglino VK2CJV, Ryde.

1985 HOME BREW CONTEST

The winner of the 1985 contest was Michael Jones VK2KMU, who constructed, from a kit article, the Omega, nine-band SSB/CW HF transceiver. The project was described in the English magazine *Ham Radio Today*. Michael was presented with his prize at the recent Seminar.

Now is the time to remind all that the present years contest is now open, entry forms are available from the Divisional Office and the closing date is the 31st December 1986.

JUNE HOLIDAY WEEKEND

A reminder that, over the weekend of 7th and 8th June, the Oxley Region ARC will be conducting their Annual Field Day at Port Macquarie.

REPEATERS

The Armidale Amateur Radio Club has submitted an application to establish a 70 cm repeater on an elevated site to the east of the city, to serve the region. The requested channel is 8175. Call sign is VK2RNT. The application is in order for processing.

During April, a posting of information was made to all repeater groups. It was mainly to update their listings for the new Call Book. If your group is as yet to return the various forms, please do so without further delay.

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VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

ANNUAL GENERAL MEETING

The Annual General Meeting of the Victorian Division of the WIA was held on 14th May. A full report of the AGM will appear here shortly.

TIME CAPSULE

The Time Capsule was sealed at the AGM, and will not be re-opened until 2010 when the Institute celebrates the WIA 100th Anniversary.

WANTED OR NOT—WANTED SERVICE

A disposals equipment service is available to members through the Sunday Morning Broadcasts via VK3BWI.

The WIA has received permission from DOC to broadcast details of equipment for sale or items wanted. The service can include the price being asked for the equipment.

DOC has stressed that the offering of disposals equipment on-air is only authorised through the WIA weekly broadcast. This privilege does not extend to nets, hook-ups, or general QSOs by radio amateurs.

Amateurs who have equipment they wish to dispose of, or are looking for a particular item of gear should write to the WIA Victorian Secretary. The information will be checked and put on a list for the Broadcast. Anyone wanting to make contact with the potential seller or buyer of an item broadcast must contact the Wireless Institute Centre between 10am and 3pm weekdays for further details.

LINTON-HARRISON PAPER

The Victorian Divisional Council met on 20th March, and at the request of Jim Linton VK3PC, the paper *Amateur Radio — Future Direction* was discussed.

The paper proposed four steps to improve the current licensing and examination standards and conditions:

Introduction of a new Novice licence with a lower grade theory examination

Enhancement of the current Novice licence, and the addition of Data Transmission mode privileges

Introduction of an Intermediate Novice licence with additional privileges

Removal of Defined Mode restrictions and an increase in the power limits.

Following discussion, a motion proposed by VK3XV and seconded by VK3BBM was carried by Council as follows:

*Council **does not agree** with the lowering of the technical standards for entry into the amateur ranks in any way, and believes persons not achieving the current standard are well catered for by the Citizens Band service.*

*Council would be prepared to support an up-dated Novice licence of the same technical standard, with additional questions to be included on data transmission modes — **CW to be retained.** Council considers Novices should then be allowed data transmission privileges on a portion of the UHF band, and on a 100 kHz segment of the 10 metre band below 28.350 MHz. This is to allow contact with US Novices using data modes. Council believes Novices could be allowed a small segment of the UHF band for voice transmission, and possibly a spot frequency on VHF to make use of existing digital repeaters.*

*To provide an additional entry point into amateur radio for Computer Hobbyists and experimenters, Council would give serious **consideration** for an additional licence class. This licence would be exactly the same as the up-dated Novice — without the CW requirement. Holders of this class of licence would have no HF privileges at all.*

Council would support the removal of Defined Mode restrictions for AOCP and LAOCP holders in the VHF and UHF spectrum only Council considers the Power Limit is not within the scope of the discussion paper, and should be discussed as a separate issue. The subject of Unattended operation is believed to be already addressed in the updated DOC Operating Handbook.

(Note: Current holders of a Novice licence would automatically be allowed all privileges of the Updated Licence).

Council requests that all amateurs take special note of paragraph 3 of the motion which states the council is prepared to give consideration to this option.

Members could be of the opinion that, if this proposal was to be recommended, it may well have an *adverse effect* on our hobby and Council is *not prepared* to give any decision without reference to the members of the VK3 Division.

All members should give this matter serious thought and make your wishes known to Council *in writing*. All correspondence should be addressed only to The Secretary, WIA (Victorian Division), 412 Brunswick Street, Fitzroy, Vic. 3065.

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NEW MEMBERS

We extend a warm welcome to the following amateurs who became members of the Victorian Division during March 1986.

J Chan VK3CBQ; James Gay VK3BBF; John Hill VK3ASS; John Ho VK3AVF; Henry Lim Meng Fung 9M2HL; Paul McMahon VK3DYP; Jackson Perkins and Douglas Richards VK3CCY.

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QSP

TOWER FUND

Amateurs in Kentucky have established a fund to assist John Thernes WM4T with legal expenses to fight restrictive tower ordinances. John's case, which has been remanded from the Federal Appeals Court back to the Federal District Court, has already cost him an estimated US$16 000 in legal fees with no end in sight.

From The ARRL Letter

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

1986 RADIO CLUB CONFERENCE

Again this year, the venue for the Conference was Griffith University, on the south side of Brisbane. This campus is set in a lovely bushland setting and is very accessible via the South-East Freeway, being an easy drive of about 10 minutes from the centre of Brisbane City. The meeting room is good acoustically and has a large blackboard, overhead projector and the seating rises in tiers from the front. Each delegate sits at a desk and has an unobstructed view. The cafeteria was available for meals but this year, accommodation was not available. This was notified only a couple of weeks before the Conference and threw the organising committee into disarray. However, a few telephone calls later and the situation was resolved, accommodation being arranged in the general area near to the University.

There were 17 clubs represented, from Cairns in the north to the Gold Coast on the southern border. Visitors to the Conference were Michael Owen VK3KI, the Honourable Ian MacPhee MHR, the Shadow Minister for Communications, Lance Bickford VK4ZAZ, from SES State Headquarters and John Bews VK4KJB, who gave a talk on Packet Radio.

On Sunday morning, Mr MacPhee spoke to the gathering and, not only sought questions from the delegates, but spent considerable time in asking questions of the delegates. What better way for a politician to gain knowledge of a special subject than to ask the people at the very grass-roots of the matter. All felt that Mr MacPhse's visit was a very valuable one — to both parties.

The Conference discussed the paper, *Amateur Radio — Future Direction*. Thoughts expressed were many and varied but most were not in favour of the lowering of standards or concentrating on recruitment from any one group. Most agreed that our object should be to make the public more aware of amateur radio. There were no real solutions found but the paper certainly has brought forth plenty of discussion and this, most would agree, was its aim.

Both club motions and Federal motions for the 1986 Federal Convention were dealt with, but cannot be recorded here, the minutes of the Conference run to some 22 pages of foolscap.

Both of the Queensland Federal Representatives gained valuable insight into the general feeling toward the motions for the 1986 Federal Convention and, as in past years, the Queensland voice over the ANZAC weekend was heard loudly and clearly at the Convention in Melbourne.

The WIAQ Council is greatly indebted to these people who worked so hard to bring the 1986 RCC together, Anne Minter VK4KZX; Barry Ker VK4BIK; Aaron Hoppe VK4AHO; David Jones VK4NLV and Anne Stafford.

NEW UHF REPEATER IN QUEENSLAND

The Dalby and District Amateur Radio Club have installed a UHF repeater on Mount Mowbullen in the Bunya Mountains. The frequencies are 438.700 MHz downlink and 433.700 MHz uplink. Please amend your Call Book to include this information.

CORRECTIONS TO 1985-86 CALL BOOK

On page 120 — The South-East Queensland Teletype Group meeting should read the *first* Friday of each month.

On page 113 — The Broadcast Directory, in the VK4 section, delete the words *and 20 metres RTTY at 2000 hours.*

The SEQTG runs a news broadcast at 1000 UTC on Monday evenings. The frequencies are — *two metres, channel 7050; 3.630 MHz and 7.045 MHz. Call sign VK4TTY.*

CYCLONE WINIFRED

CAIRNS PARTICIPATION

When *Winifred* started forming in the Coral Sea on 29th January 1986, VK4BAJ, VK4AMO and VK4YG commenced a tracking plot and set-up a standby Network. Winifred crossed the coast on 1st February, south of Innisfail with a centre pressure of 960 mbs and estimated 220 km/h wind gusts. There was considerable damage to buildings, crops, power and telephone services, and road and rail services were cut over a wide area.

A Disaster Area was declared and SES channels became overloaded. WICEN was requested to provide a VHF network. SES also asked for amateurs with hand-held units to assist the Army and Navy teams. Some 35 amateurs were involved and were able to carry out the tasks allotted to them by the SES.

Official involvement of the Cairns Amateur Radio Club commenced on 1st February and the Club station was manned. Brisbane SES requested a link be set up between Townsville and Cairns, and this was established by the use of the VK4RCA Repeater.

TOWNSVILLE PARTICIPATION

The SES Regional Office was manned from the evening of the 1st February until 3rd, with very little sleep being had by the participants. The SES transceiver at Innisfail failed and Peter VK4BDK made his way, at the height of the cyclone with considerable risk to himself, to get them back on-air.

All amateurs involved were praised for a job well-done and official acknowledgment was received from the Assistant Director of SES Headquarters in Brisbane.

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

It is with regret that we report the passing or two well-known Old Timers, Harvey Judd VK5HQ and Alan Heath VK5ZX. Both had been ill for some time and in both cases, it would have been a happy release from pain.

Our sympathy goes to both families and, in particular, in Alan's case to his son Chris VK5ZZX, to Alan's brother Colin VK5FX and Colin's son, Rob VK5ARX.

FURTHER J150 AWARDS to 31st March 1986.

13	VK1HZ	27	VK5SJ(3rd)
14	VK5NBB	28	VK3DJU
15	VK5SJ(2nd)	29	VK2JBM
16	VK5ATU	30	VK2NAN
17	VK3NLR	31	VK6HT
18	VK5OU	32	VK3BCD
19	ZL3KR	33	VK5AJK
20	VK2PXS	34	L40885
21	VK2KFV	35	P29JW
22	VK2CKW	36	JQ1EBK
23	VK2CP/ VK5PWM* *equal time for 150th point		
25	VK5NDB		
26	VK2PKT		

AMATEUR TELEVISION GROUP

The SA ATV Group have had some excellent publicity recently. Thanks mainly to Max Whiting VK5KTZ, who just happens to work in the *Advertiser* newspaper. Max did an excellent article on Jamie Jenkins VK5ZAA, one of the youngest members of the ATV Group, in the Saturday Magazine section of the *Advertiser.* This was in turn picked up by Channel 9 in their *C'mon Kids* program for children, where they interviewed Jamie, and during the session he called up on-air and Lee Cordell VK5NK, on of the oldest ATVers, came back and spoke to Jamie.

I was recently invited to join the ATV Group at their next bi-monthly meeting. What I did not know at the time was that their next meeting was to be a tour of the new Adelaide TAFE college (recently opened by the Duke of Edinburgh), and in particular, the Educational Multi-Media Department where programs are made for schools, etc.

Our guide was John Ingham VK5KG, Federal Video Tape Co-ordinator.

What an eye-opening tour it was, believe me. Television will be watched with a far deeper understanding on my part, in future, and I am sure that the ATV boys would have gained even more from a technical point of view than I did.

My thanks to Rod Rees VK5ACA, their President, Charlie Baldacchino VK5ACF, their Secretary and everyone else for an evening well spent.

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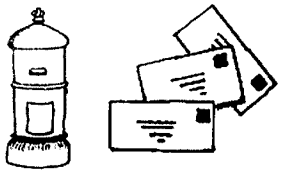
BUSINESS FAX TAKES ON

Sending business communications by facsimile has taken on in Australia with industry sources estimating there are now around 30 000 FAX machines in use. This represents an increase of about 33 percent in 12 months.



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

DON'T KNOW WHAT I WOULD HAVE DONE

Permit me to add my voice with others on the benefits which flow from WIA membership. In particular, the activities of dedicated people responsible for education and skill building of new members entering amateur radio deserve special mention.

First, the Education (Correspondence) Course supervised by Cec Bardwell was a vital ingredient in getting basic insights into radio necessary to pass the DOC exams. Self study may suit some but if you have not had to swat for exams for many years, then I can thoroughly recommend the course as well worthwhile and cash wisely invested. Constant revision of the notes and problem papers got me there.

Second, the Education Service/Slow Morse Panels of VK2 and VK5 were also vital in being able to acquire the necessary CW skills in sending and receiving. It is in this area that I respectfully offer the following suggestions for better practices.

CW conversations I have tuned into confirm the wide variety of topics in the general traffic. All of the practice passages are educational in the sense that you finish knowing more about something than you did when you began — I have learned how to curry pork chops, about the Urunga Shire Maintenance Program, blood pathology, ocean liners, explorers and more.

In my view, 25 to 50 word passages should avoid those passages that can be journalised. For example, recipes give nouns, measures and timings, etc which are repetitive. Likewise, continuous passages without subject change but with speed change lend themselves to journalising quite readily, and more so if your general knowledge of the subject is wide. Many I heard went for long periods without any numerals. Practice passages which covered the whole alphabet, with numerals and punctuation would seem to be preferable, and one that *fills the bill* quite well is the weather forecast/synoptic situation. Those really kept me on my toes!

Another suggestion I would make is that, similar to the DOC exam, the code be sent at eight and 12 words per minute, spaced to give seven, nine and 11 words per minute overall. I don't under-estimate the skill necessary to do this well.

In conclusion, I would like to thank the WIA office bearers and volunteers involved in these activities. *I don't know what I would have done without them.*

Alan Smith VK2BHF,
10 Banool Avenue,
St Ives, NSW. 2075.
ar

PENFRIEND WANTED

My name is Freddy and I am 35-years-old.

I would like to correspond with some Australian radio amateurs so I may learn more about Australia, and amateur radio in Australia.

Cordially,

Freddy Henckens ON7WT,
Merelstraat 37,
3550 Heusden — Zolder,
Belgium.
ar

TECHNICAL CORRESPONDENCE — SATELLITE PROGRAMS

I refer to VK3AFQ's computer program published in June 1985 AR and his accompanying article on its use for the location of geostationary satellites, published in May 1985 AR.

I find that the program has shortcomings which limit its use, some of which are easily corrected.

1 The program gives accurate results only if the observer is located in the Southern Hemisphere. If a northern latitude is entered, the calculated azimuth is in error. This can be corrected by the addition of a single new line:

331 IF LA > 0 THEN AZ = AZ + PI

The program generates azimuth angles which may exceed 360 degrees. This may be easily corrected by the addition of a further new line:

332 IF AZ > 2 * PI THEN AZ = AZ — 2 * PI

2 Seemingly quite randomly dependent on the input parameters the program will fail due to overflow error. This is annoying, because of its seeming randomness. These overflow errors may be avoided by using the arc cosx function for DEF FNA(X) in line 300 in lieu of the $\pi/2$ — arc sinX function used by the author. Line 300 then becomes:

300 DEF FNA(X) = ATN (SQR(1-X*X)/X)

However, this last change will give rise to overflow errors if the observer is on the equator and LA = 0. The value of X calculated in line 200 will then also equal 0 and it follows that the attempt to divide by 0 in DEF FNA(X) will again produce an overflow error. This behaviour is quite predictable, unlike the overflow errors produced when $\pi/2$-arc sin X function is used in line 300, and close approximations of azimuth angles may be obtained by entering a small +ve value such as .01 for LA instead of Zero.

It should also be noted that this last change will give rise to overflow errors if the observers latitude LA = ±90 degrees, ie he is at either the North or South Poles. This is of no consequence of course, as the satellites are too far below the horizon at the poles to be of any use to amateurs who might perhaps venture there.

Re the Morse Code Generator Program, AR January 1986 pp8. The reproduction of the program listing is too small and too faint for me to read other than with great difficulty. I certainly could not type it into my computer without making literally hundreds of errors. May I make a plea for larger, darker print for such listings in AR for the sake of old timers, such as I. I assume the listing was photo-reduced to permit printing in two columns.

Yours faithfully,

Murray Higgins VK5AQM,
15 Beta Crescent,
Panorama, SA. 5041.

Editor's Note: Computer program listings are photographic reproductions when printed in Amateur Radio (printed in this manner to avoid typographical errors and reduced to conserve space). This is the reason that it is imperative that contributors send computer programs printed with a dark black ribbon. We know of the difficulty and are looking at alternatives such as computer bulletin boards and packet radio. Any other suggestions are welcome.
ar

TECHNICAL CORRESPONDENCE

An obvious error has been pointed out in the Four Watt CW Transmitter article for Novice Notes, April AR. The last paragraph suggests a crystal frequency range of; from 3.526 to 3.800 MHz. This, of course should read *from 3.526 to 3.580 MHz.*

Now that many transmitters have been successfully constructed by other readers, indications are that operating the transmitter from a supply voltage of greater than the nominal 12 volts can cause excessive heat to be generated by the output MOSFET. There are three solutions to this problem:

— fit a larger heat-sink to Q4, or
— reduce the supply voltage to 12 volts or
— reduce the value of bias on the gate of Q4 by changing R14 to 56 ohms.

My apologies for any problems that may have been caused. It appears that the IRF510 MOSFETs may have considerably more spread than was first assumed.

Yours fraternally,

Drew Diamond VK3XU,
Lot 2 Gatters Road,
Wonga Park, Vic. 3115.
ar

SPUTNIK RECORD

I am interested in locating an *authentic* recording of the first satellite to be placed in earth orbit, namely, Sputnik 1.

I am sure someone in the amateur ranks must have made a recording of this satellite.

The recording is required for a talk/presentation I am preparing on the topic *Satellites.*

Any assistance would be greatly appreciated.

Yours sincerely,

John Dunkley VK5JE,
9 Elva Avenue,
Pooraka, SA. 5095.
ar

AN INDIFFERENT DEALER

Recently I decided a particular make and model of rotator (as advertised) might suit my need.

To obtain a brochure on that item cost *three* interstate telephone calls (to the one dealer) over a period of four weeks.

A note from the dealer read *in stock — $725 including delivery and insurance.* Immediately I contacted the dealer (again by telephone) for the transfer of the above sum.

Alas! *We don't have this item in stock. Perhaps in six or eight weeks!*

And . . . The misleading advertising continues.

Henceforth, I will remember this costly and time-wasting exercise, and can only have scorn and contempt for the advertising and trading activities of this dealer.

Frank Walsh VK5NJW,
PO Box 122,
Blackwood, SA. 5051.
ar

COMING TO GRIPS!

I am finding Amateur Radio is becoming a much better publication than when I first started getting it a few years ago. In my opinion, you are really coming to grips with what members require. Keep up the good work.

73

Ben Ronald VK2EHR,
3 Mullawa Place,
French's Forest, NSW. 2068.
ar

AN INSIDER LOCKED ON THE OUTSIDE

Just browsing through the last few copies of *Amateur Radio,* I noticed with great interest that there seems to be some concern among members that new people are not attracted to this noble hobby. The reason in my opinion is that it is generally too difficult for a real amateur to become a radio oporator. After all, an amateur is one who is interested in pursuing an art for the *enjoyment* of it, rather than being a professional. With readers indulgence I would like to relate my own experiences.

Some 25-years-ago I was in the Australian Regular Army as a professional soldier and wireless operator in the Signal Corps. I was a CW operator with a CW speed of over 25 WPM. But, we were operators, not technicians. We knew all about aerials, frequencies, dummy loads, microphones and procedures (much more disciplined and stricter than what I hear on the amateur bands), but we learned nothing about resistors, diodes, screwdrivers or soldering irons. This was not necessary, you see, as if something fizzed a mechanic came and fixed it.

Upon leaving the Army, after operating radios full-time for six years, I wanted to get away from radio and entered the business world. However, a couple of friends are amateurs and, after visiting their shacks, I thought of getting into it again for *pleasure.* Now I have some radio equipment in the Study, and a couple of dipoles in the backyard. I joined the WIA and started on the Correspondence Course (a very good one), but the licence seems further away than ever. *Why?*

Firstly, I operate my own business which keeps me occupied for some 65 hours per week. Then, there is my family to whom I wish to devote some

time. Also, I try to put some effort and time into the community, scouts, church, etc. Finally, I cannot make myself at all interested in learning about capacitors, inductors, Ohm's Law, etc. Why should I? If my radio breaks down I will get someone to fix it! My wife operates a steam and dry iron — she doesn't need to know how it works. My children operate two computers but why should they need to know anything about the insides? Yet, when it comes to transceivers, that is different.

Has anyone tried learning subjects they are not interested in and that they know they are not going to use in the future, anyway? All I would like to do is to talk to someone far away occasionally. Nothing special, surely? I sometimes listen late at night (2 am) and I hear people from Israel, Germany and near the Tower of Pisa making DX calls. Either everyone is asleep or on a different band.

Also, I went to a WIA meeting in Brisbane. Once again, these meetings are geared for the technically minded. Amateurs drop in to deliver or pick up QSL cards, call signs talk to each other about their experiences, but there is nothing there for outsiders, as without a call sign, you don't belong.

At the rate I am going, I should be able to sit for my licence in about 1998. This will not help the average age of amateurs. In the meantime, my QSA will remain 0.

Frustratingly,

Roeland Martin,
23 Lairg Street,
Kenmore, Qld, 4069.
ar

USE THEM OR LOSE THEM

I believe that the adage, *if you don't use 'em, you lose 'em* applies not only to muscles and brain cells, but possibly to the WARC-bands as well.

There are some obvious reasons why some amateurs are not making use of the new bands. In the first place, there are still many transceivers and transmitters giving admirable service, but not covering the WARC-bands. The same would apply to ATUs and linears.

In other cases there are carefully-designed antenna systems which the operators are loathe to modify to take the new bands.

In other cases, I think sheer conservatism and an unwillingness to try something new is probably the basic reason why some never attempt to work the new bands.

All this is regrettable, but what is really shocking is to find that use of the WARC-bands was expressly forbidden in the 1986 John Moyle Contest.

Here we are, advertising to the whole world that VK amateurs will not use the WARC-bands in one of our most important national contests.

I am aware that some exclusion applies to other contests, including some important overseas ones.

I would suggest that those designing the rules for contests and awards take the opposite route and give bonus points for use of these bands, at least for say five years, until they are more widely used by the amateur community.

Indeed, there seems to be a case for the WIA to establish a new award especially for the WARC bands in order to encourage their use.

A good example was set by those who drew up the rules for the VK5 Jubilee Award which is running throughout 1986. There are bonus points towards the award for using WARC bands, a formula which other award-designers could emulate.

It is not very difficult to get-out on a WARC band if your rig includes the frequencies. Most of us have a pole, tower or other structure which will accommodate another piece of wire in the form of a dipole sloper/s for one or more of theses bands (try 30 metres for a start). This will not have the gain of a beam which has been tuned and nurtured over the years, but it is a start — and a practical demonstration that we want the WARC bands and are determined to keep them.

Yours sincerely.

Ken Gott VK3AJU,
38A Lansdowne Road,
St Kilda, Vic. 3183.
ar

DISCUSSION PAPER

I have taken the April Editorial to heart and had another look on the Discussion Paper in the February issue. It is a well thought out proposition that deserves careful consideration. One aspect that could be looked at is the operation of so-called *gentleman's agreements*.

The main thrust of the proposal appears aimed at the recruitment of computer enthusiasts. A high-technology, and therefore high-cost direction. This is probably as it should be and merits investigation but one major area of concern does not seem to have been considered.

There are two aspects involved — low cost and ease of acquiring equipment, plus use of Morse Code as a communication medium. These two can go hand-in-hand for a beginner. The building of a simple transmitter such as that by Drew Diamond on page 20, is a much easier starting point than some of the rigs pictured on AR's covers.

Low Cost — Most children of school-age — where we should be, and are, approaching them — do not have a great deal of spending money. Their parents already have steep education expenses and such things as excursions, sometimes interstate, etc. So ... expensive amateur equipment is one of the major stumbling blocks to recruitment of a large number of potential amateurs. Once they leave school they are no longer so accessible.

Morse Code — I can almost hear you say — *not that one again*. Please bear with me a little while. I spent hundreds of hours getting myself to the point where I passed the AOCP — in the first level mode, ie recognition of letters by their dot/dash construction. None of the training I underwent enabled me to get to second mode, let alone third mode recognition. My mind appears capable of quite high speed operation but does not shift easily to the more automatic modes. First mode is very tiring. I believe very strongly that the methods generally taught — including by the services — are adequate for some people and of virtually no use for others. Some time ago I did a survey of Service Morse Code Schools and could not find one person who knew anything about the psychology of teaching and learning Morse. A couple of people asked me to let them know if I discovered anything. A couple of enquiries overseas did not help. If the services know their average failure rate they can always load their courses to give then the number they want. We cannot afford that luxury.

Summary — Morse Code is a very good, low cost beginning point for potential amateurs. Many amateurs who passed the Morse tests did so with a skill that is not a viable one — it takes too much out of them psychologically to be enjoyable.

I suggest that the WIA should investigate different teaching and learning methods. Perhaps computer centred methods with visual display would help some! Perhaps there is a very simple method just waiting to be discovered. The often-voiced opinion that people who can't learn Morse are just lazy should be discouraged.

Many amateurs would spend more time on air if they could enjoy sending and receiving Morse Code.

Yours sincerely,

Neil Trainor VK3IJ,
133 Bladin Street,
Laverton, Vic. 3028.
ar

At a recent meeting of FAMPARC, a debate was arranged on the Discussion Paper produced by Jim Linton and Roger Harrison, and the Club would like to thank them for the obvious work and effort that went into the article.

However, the general consensus of opinion after two hours of discussion was that, while we appreciate moves that will increase the interest and membership of our hobby, it should not be at the expense of the technical qualifications built up and increased during the years by members of the Wireless Institute in constant dialogue with the Department of Communications. It has taken great effort to acquire the benefits and amateur bands that we currently have the privilege of using, and any lowering of the standards of entry must be detrimental to the hobby.

Contrary to several opinions, it is *not hard* to gain entry into amateur radio — it does however, take a person with character and perseverance and a great will to join the amateur ranks.

There are hundreds of computer buffs who have entered amateur radio in the conventional way and are a great asset to the hobby, and no doubt there are many more who would benefit amateur radio, but by the same token there are hundreds of others to whom it would be just a *flash-in-the-pan*, and not understanding the sprit of amateur radio, cause a great deal of trouble and dissension.

It is a pity that the Discussion Paper was so long and covered so many suggestions, it was nigh on impossible to cover the entire paper in one evening. However, at the conclusion of the debate, a motion was put that *the members present consider the licensing qualifications required by the Department of Communications are adequate for the needs of amateur radio at present.* The motion was passed — 19 for and three against, with three abstaining.

Gordon Buchanan VK3BGB,
Secretary,
Frankston and Mornington Peninsula Amateur Radio Club,
PO Box 38,
Frankston, Vic. 3199.
ar

The discussion, and subsequent letters have certainly put some points of view, but I feel, looked at the symptoms rather than the causes. Perhaps we do not need more amateurs at any price, ie by twisting examination criteria. Rather, do we need more interest and less apathy from many of our present population.

For example, in Tasmania, there are over 500 licensees. *How many of these are active, or listen but do not communicate? How many do any construction or are active in the WIA?* Local answers would provide a fair yardstick for the national scene.

So what has gone wrong?

The discussion overlooked the impact of developments in our society, affecting every facet of our life-style. Read the daily newspapers, full of wars, crime, violence, sex, divorce, alcohol, drugs, etc, which seems to dominate the news. Sunday is now a day of commerce, sport and fun. Like it or not, we are now practically a pagan country. The relevant point is that all this has affected our whole life-style, tearing at the very fabric of our society, including amateur radio, and it is no use burying our heads in the sand. The good old days have gone.

There is so much diverse activity offering that, whereas at one time, radio predominated the spare time of amateurs, it must take its turn with a multitude of other interests or even be replaced. Many would prefer to take a golf club, skis, or a ball and enjoy life. Or perhaps retire to the local, or go to the weekend shack.

Let us look at amateur radio of a few years ago, before television or computers or too much money interfered. To work and qualify for the AOCP with a 14 WPM Morse test was considered somewhat meritorious. Subsequently, a frenzy of construction followed, as nearly all our *rigs* were *home-brewed*, tested, operated and maintained — likewise test gear. The amateur knew what it was all about with interest divided between construction and operating on air. We had long discussions on air about our gear, exchanging ideas and experiences, and offering advice. The bands were full and we cried for more space. This was amateur radio in the full sense. *What hope is there of this state returning?*

Without question, the enormous advances made in the field of electronics have only served to lure activity away from amateur radio and construction.

To suggest a *Symbiosis* between computer operators and amateurs is, in the main, a pipe dream. The former do quite nicely without the added study and expense of amateur radio. More likely amateurs are lured to computer activity.

It is unlikely that lowering or adjusting grades of licenses will have any long term effect on the problem.

Already, to some, the situation in which licenses

are now obtained appears ridiculous. To take an examination one fills in some numbers or ticks (like a lottery) and hopes for some luck. If successful, all that is needed in some money for a black box. A far cry from the old days.

Now it seems that there is some suggestion for a kindergarten grade. Amateurs at any price! What a pity. *Why not sell licenses at the Post Office?*

For people who wish to communicate without serious study, the Citizen Band is there, and on UHF with repeaters appears to be quite successful.

Surely, if a thing is worth having, it is worth working for. Perhaps the real amateur is part of a dying race. After all, people will decide for themselves their activities. As the old proverb says: *You can lead a horse to water but you can't make it drink.* Radio is no longer a nine days wonder, perhaps amateur radio is on the way-out. We need a genius to solve it.

Max Ives VK7MX,
Cosgrove Park,
Launceston South, Tas. 7249.

In reply to the Discussion Paper, February's AR — the thrust of the paper is to have six licence levels (now four) so that we may increase the number of young men and women joining amateur radio; and to provide digital voice/data techniques on a wider scale than currently in use on the bands.

To do the above, the authors suggest we make the entry points easier, hence the introduction of two new call allocations — the New Novice and the Intermediate.

I, and probably many others, agree on the paper's theme, however, the approach suggested is not only cumbersome, but impractical. Cumbersome because of the great variety of calls proposed and impractical because of not only call sign allocations, but because the real solution is not to be found by making entry into amateur radio easier.

Say, if the above proposals were introduced next year and we had, by the year 2000, the following:
(Figures in brackets also assume we have 30 000 amateurs by 2000).

Below 20 years — 15 percent (4500)
21-30 years — 20 percent (6000)
31-40 years — 20 percent (6000)
41-50 years — 15 percent (4500)
51-60 years — 10 percent (3000)
60 plus — 20 percent (6000)

My figures are based on the early CB to amateur exodus, plus a further factor that indicates amateur radio will double every 13 years. Not unreasonable, provided the eventual total is no more than two percent of the total population. This is because we make amateur radio easier to enter and more attractive to youngsters. The distribution is, of course, ideal. I am amazed that a development of such a strategy is not being considered by the WIA. What would the result be if nothing is done? Must we rely on the release of a paper to get the ball rolling? Are my figures appropriate or will we get thousands of new recruits?

From my figures we well may get an extra 50 percent new amateurs over the first five years and an extra 1200 or so extra every year after that. These numbers, if the proposals are implemented are above existing joining figures of about 400 a year. Quite a strain on the DOC at examination time, but the best part for the WIA would mean an extra revenue double that being received now.

My suggestion is to keep the existing four call allocations of Novice, Limited, Limited/Novice and Full Call, but drop the CW requirement from the Novice exam and give Novices 10 watts on 70 cm (SSB and FM). No data transmit privileges.

Five words per minute CW is *not* CW. To engage anyone at five words per minute for a QSO is impossible and very painful. Most novices conduct their QSOs at greater CW speeds. Indeed, most novices only do the CW to get a licence — not to engage in CW on the bands.

To give a *new novice* 70 cm FM only is just a waste of time. The real traditions of amateur radio are on the HF bands. We all know the benefits of being able to sit and listen to HF for many enjoyable hours. Try listening to VHF/UHF for many hours — mostly silence, local calls and through a repeater. The advantage of FM VHF/UHF lies in the 400 watts PEP power, experimentation with sophisticated gear, transmitting ATV, satellite, RTTY or fast data. These are not within the reach of the youngster, but a cheap HF rig is and a 70 cm unit if needed can be attained either in kit form or from ex-commercial sources. If youngsters were asked which band they preferred I am sure it would be HF, not UHF, so let's give them what they want, not what we want them to have.

Which HF band — 10 metres SSB/FM of course! It is a natural progression from the familiarity of CB and the FM part will be a challenge to get operational — and every youngster needs a challenge.

Every novice knows that the theory is not difficult but the CW is! Every novice thinks seriously about the limited exam and most pass it at their first attempt. The existing novice examination is not difficult and a couple of months of application will get anyone an exam pass. To make the exam easier is not, at this time, appropriate. If such a proposal does not work, then make the exam easier, but I believe CW is the barrier to the younger aspiring amateur — not the theory. Let us not make it easier for the sake of numbers, but let us make it a more exciting licence.

Peter Frederick VK3BSF,
61 Ashwood Drive,
Ashwood, Vic. 3147.

SQUABBLING

So, it is time to squabble over licensing again. It has taken some people a long time to wake up to the fact that the amateur population is in decline. Some of us who have been in the education system for many years have seen that amateur radio is a non-issue with the youth of today. In fact, they do not know that it exists. The question should also be asked *why are the many students of electronics at all levels in TAFE colleges not taking an interest?* There is something wrong with amateur radio as it exists at present.

Electronics has progressed in quantum leaps in the last 20 years. Sadly, most of the amateur fraternity have regressed in their ideas about amateur radio. CB (with all its problems) was the best thing that happened to amateur radio in the last 50 years. Many of these people who started out as pirates became licensed CBers when it was legalised and then took up amateur radio. The key to this is that they bought their equipment, they used it and then wanted something more. The amateur fraternity wants all people to sit in classes for up to a year learning theory out of a book with the prospect of getting on the bands at a much later date.

Most amateurs begrudgingly accept the *new blood* CB brought to the hobby of amateur radio, none-the-less. CB is almost always used as a derogatory term by many amateurs who sit around reminiscing about the old days, the attempts to jam people on 11 metres, the *pinching of our bands*, etc. These people are not ratbag stirrers, we are sure they are solid citizens. Of course, it is still going on by other *responsible citizens* (see editorial in ARA, February 1986). We ask you, what prompts a *solid citizen* and a licenced amateur to jam a UHF CB repeater for seven hours every night?

The amateur radio fraternity has long suffered from a combination of arrogance and elitism. Amateurs always keep telling each other how important they are to the community. We put it to you that 99 percent of the community do not know anything about amateurs and frankly, do not care. This *we are important to the community* argument may have been true in the past but it is wearing a bit thin in the 1980s. It only serves to fool people that amateur radio is not *just another hobby* but something special.

We are sure it is something special to most of the current amateurs; but not for long. One only has to browse through the pages of the WIA Journal, Amateur Radio, to realise that amateur radio is an old man's hobby. In all the pictures you would be lucky to find a person under 40, and virtually no women or teenagers. Contrast this with a meeting of MBUG (Microbee Club), there you will find a truly representative cross-section of the population.

Looking at the statistics on the amateur population, it is clear to see why this is the case, and, why one can tune around the bands most of the time and find great expanses of nothing. Most of the bands resemble 11 metres before CB took over. The spectrum is a scarce, natural and public resource and should be used by as many people as possible. The aim of the licensing system should be to maintain order on the bands and ensure there is no interference to other users. The current system, through this fallacious *maintenance of technical standards* argument serves only to keep by far the greater majority of the people interested, off the air.

The arrogance, the elitism, the resistance to change that pervades the amateur fraternity is shown very well by the letter from Mr B Wilton VK3XV. On the Linton/Harrison proposal: *This would appear to be a retrograde step . . ., I seriously wonder who would gain the most from this 'marriage' . . . the amateur radio movement or the computer hobbyists? We must not allow our technical standards to be lowered — if anything they should be raised!.* No problem, Mr Wilton. Keep the bands to yourselves so most of you can sit there with your expensive, off-the-shelf toys and carry on inane conversations which laughingly pass for traffic related to *technical investigations, research into or instruction in radio communication techniques.* But maybe the DOC should take you up on the raising of technical standards. In fact, re-testing should be introduced for every amateur every three years. The DOC can then make sure that all are up-to-date with the latest micro-processor technology used in the latest transceivers. Many of the amateur population take themselves too seriously with all this technical standards nonsense. The way most amateurs keep up with technological developments is by buying the latest micro-processor controlled transceiver!

These arguments about *standards* will serve only to maintain the elitism of amateur radio and eventually allow it to die. We cannot understand how these people expect amateur radio to survive and expand if the current population of amateurs is aging and very few new young people are entering.

We think the Linton/Harrison proposal does not go far enough. It is basically a slight re-arrangement of the current system. We suggest that a totally new approach be taken. The Canadian proposal seems the more sensible and logical:

a For operations on all bands and all modes above 30 MHz, using commercial equipment only, with 250 watts.
— A shift away from technical knowledge and an emphasis on the knowledge of regulations, interference problems and antenna theory.
b For operation below 30 MHz.
— 12 words-per-minute Morse.
c For operation on all bands and all modes with the option of building equipment and 1000 watts.
—Knowledge of advanced electronic theory.

In fact, we would go further, eliminate the Morse requirement totally. Australia has to date not adhered to ITU rules by allowing 10 and five words-per-minute for operation below 30 MHz.

This type of licensing would have the effect of increasing the amateur population by bringing in many people who have an interest in electronics, computers and communications but normally use commercial equipment. There are many people who are responsible citizens who would be lesser nuisances than some of the currently licensed amateurs. As has been shown many times in all walks of life, passing exams does not guarantee proper and civilised behaviour.

One argument that is advanced against commercial equipment is that it will be too expensive for young people to get into. This argument is made in the March issue of AR. To this we say *look at the prices of commercial radio equipment at the bottom end of the market, it is cheaper than most computers.* Do you see young people not getting interested in computers

because of the price? With the right form of licensing it could even stimulate the local manufacture of suitable equipment for beginners. Philips is certainly well set up for UHF equipment (eg FM 620).

Drastic changes will be made in the future, otherwise the amateur population will simply die-off. Why not implement something along the lines of the Canadian proposal now and be in the forefront of the development of the hobby instead of having the WIA and many other conservative amateurs fighting change until they literally die and in the process kill amateur radio.

Amateurs are allocated just over 1506 MHz of spectrum space. Most of this is now prime space which the current amateur population as it stands, hardly makes an impression on.

The pressure for spectrum space is increasing exponentially. How long will it be before commercial interests and the government start to take a good, hard, look at those large slabs of little used space allocated to amateur radio in the VHF and UHF bands, especially?

We call on the Minister for Communications, DOC, the WIA, ARA and all progressive amateurs to work towards a totally new licensing system. A system that takes into account the technology of the 1980s. A system that allows a much greater proportion of the population on the air. A system that is attractive and has relevance to the youth of today.

Signed by:
Harry Fatouros, Computer Department 1980-1985, Preston Technical School.
Chris Holliday VK3JU, Preston Technical School, (VK3CPT).
Frans de Bruijn VK3KFV, Box Hill College of TAFE.
Greg Segal, GWS Audio/Visual.
Ian Batty VK3ZEV, Former Co-ordinator (TV), Moorabbin College of TAFE.
Peter Cossins VK3BFG, Electronics Technology, Box Hill College of TAFE.

ar

Silent Keys

It is with deep regret we record the passing of —

MR MAXWELL H BONE VK5BMH
13th March 1686
MR GEORGE HUMPHREY VK2NO
18th March 1986
MR C H JUDD VK5HQ
PROFESSOR RICHARD KELMAN VK2EEW
4th March 1986
MR EDWARD (Ted) SIMPSON VK2ES
21st June 1985
MR ARTHUR L STEHN VK4IS
16th March 1086
MR ALEXANDER (Alec) G SWINTON
VK3AAP (ex2AAK, 2AAG)
25th March 1986
MR C E WALTON VK3PWA

Obituaries

ARTHUR L STEHN VK4IS

Arthur passed away on 16th March at Maleny Hospital, having suffered declining health for sometime. He was first licensed as VK4ZLS in 1966, then obtaining his full call VK4IS in 1968, whilst at Rockhampton.

His other hobbies included photography and woodworking. During his working life he was attached to the Education Department, Meteorology Department and PMG's Department from which he retired. After retirement, he operated the Montville Model Railway Dome. This is where I first met Arthur in 1980. We became firm friends, then neighbours whilst living at Flaxton.

Arthur was one of natures gentlemen. Deepest sympathy is extended to his wife Florence, daughter Denise, and son Ronald.

Roy Stephens VK4BRS (ex VK3ARS)
ar

RICHARD KELMAN VK2EEW

Professor Richard Kelman VK2EEW came to Australia three-years-ago to establish the chair of Occupational Medicine at the University of Newcastle. The professional chair he held was only the second of its kind in Australia.

He passed away on 6th April 1986, at the age of 52.

Richard was an affable and friendly man who quickly made friends in the community and within the ranks of amateur radio. He confined his operations to CW in the HF bands. In addition, he was a skilled computer experimenter and programmer.

Richard had a distinguished academic career in the United Kingdom before coming to this country. His qualifications included Master of Science, Doctor of Medicine and PhD.

He leaves a wife, Elizabeth, and three adult children to whom we extend deepest sympathy. He will be sorely missed by his many colleagues and friends.

Contributed by Tony O'Brien VK2BOA
ar

Did you know?
Hamads are a free service to members of the WIA.
When contemplating buying or selling equipment, check the Hamads first.

SOLAR GEOPHYSICAL SUMMARY — FEBRUARY 1986

Solar activity for February was dominated by two regions which returned to the visible solar disc late in January. The regions produced a sequence of energetic solar flares, including X class events on 4th and 6th.

Feb 1	*Class M1*	2034-2115 UTC Effect times
Feb 4	*Class M1*	1018-1054 UTC
	Class X1	0732-0805 UTC
Feb 5	*Class M1*	1232-1321 UTC
Feb 6	*Class X1*	0618-0707 UTC
Feb 7	*M1*	0947-1126 UTC
Feb 11	*M2*	0328-0413 UTC
		2259-2345 UTC
Feb 13	*M1*	0102-0419 UTC
Feb 14	*M1*	0902-1028 UTC
Feb 15	*M2*	1016-1300 UTC
		1304-1316 UTC

The regions also produced a sharp rise in the 10 cm flux levels which peaked at 103 on 5th. This flux value is the highest for any day since 5th July 1984. The regions had disappeared over the western edge of the sun by the 15th and the flux levels dropped to low levels.

The first of the previously active regions re-appeared on the visible disk of the sun on 26th and produced a rise in the 10 cm flux late in the month.

10.7 CM FLUX

1=84; 2=90; 3=99; 4=101; 5=103; 6=102; 7=99; 8=98; 9=95; 10=99; 11=98; 12=91; 13=89; 14=90; 15=82; 16=73; 17-20=70; 21=67; 22,3=69; 24=70; 25=72; 26=74; 27=77; 28=79.

Average = 83,9. Sunspot number 23,6. Yearly average 8/85 = 16,6.

GEOMAGNETIC ACTIVITY

7-9/2 The geomagnetic filed became disturbed towards the middle of the 7th and was at major storm levels by the end of the day. 8th was one of the most disturbed days in the last 25 years. The early part of the 9th was also very disturbed but weakened towards the middle of the day. A=57, 208, 74.

14/2 The field was active 1400-2100 UTC. A=25.

21-28/2 The field was generally disturbed for the entire time, the worst periods being 09-1400 21st, 00-0200 and 14- 1800 on 22nd and 00-1800 on 23rd. A=22, 23, 25, 15, 17, 20, 19, 19.

The magnetic disturbance of 7-9th was a particular noteworthy feature of the month. It is difficult to compare disturbances, this event was large by any standards and was probably the largest since November 1960. it coincided with reports of aurorae sightings from much of mainland Australia. Sightings ranged from just north of Sydney, Northern New South Wales and around Brisbane. This event was almost certainly caused by the X class flare at 0625 UTC on the 6th.

The A index average more than doubled from 11,5 in January to 23,4.

Extracted from Solar Geophysical Summary supplied by the Department of Science IPS Radio and Space Services.
ar

AMATEUR CARTOONS

The name Phil Gildersleeve W1CJD, would probably mean little to most amateurs but to the readers of QST and some ARRL ancillary publications, from 1927 until the 1960s his work would be very familiar. Phil was known simply as *Gil* and was responsible for many hundreds of humorous cartoons which appeared in ARRL publications.

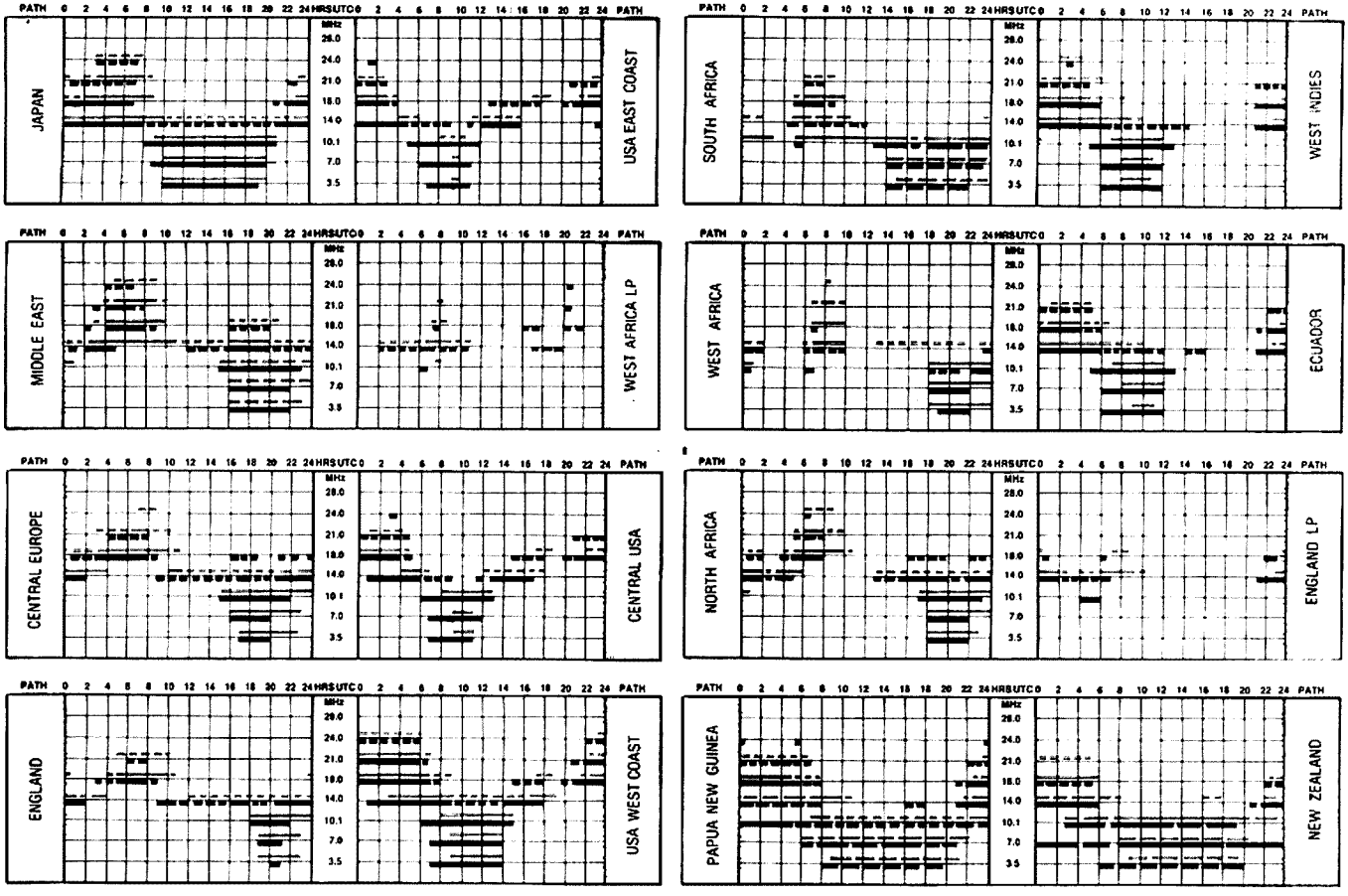
A new ARRL book, titled *Gil* has reprinted the best of these cartoons.

Should be most interesting for the old time subscribers to QST.

From The ARRL Letter

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic, 3060



FUTURE TRENDS IN SOLAR ACTIVITY

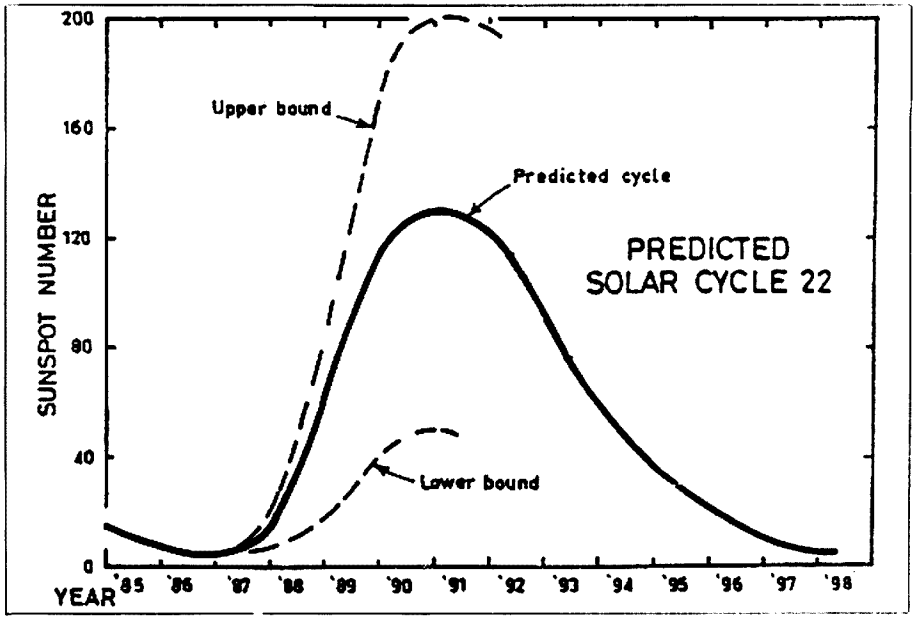
Solar Cycle number 21 is now approaching its end as the yearly-averaged sunspot number drops to values typical of solar minimum conditions. At this time, it is appropriate to ask what the next solar cycle will look like. The subject has been (as usual) the centre of keen debate for a number of years and (as is also usual) there is no consensus view whatsoever. In particular, estimates of the maximum sunspot number of the next solar cycle vary wildly — from as low as 50 to as high as 200.

IPS has prepared a prediction based on the most highly regarded techniques of the papers presented at the *Solar- Terrestrial Predictions Workshop* held in Paris during 1984.

It predicts the minima of Cycle 21 late in 1986 and Cycle 22 rising to a peak of 130 in mid-1990 and falling to around 10 in 1998.

Cycle 21 went into the history book as the second highest since records began. I guess we will just have to be patient and see what happens. In the meantime, just keep an ear on the daily reports to find the best periods. The DX is there even on 28 MHz for those who are in the know.

ar



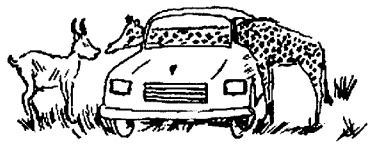
THOUGHT FOR THE MONTH

Silence is better than unmeaning words.

PORTABLE PHONES SOON

A new mobile telephone service, in the form of low powered pocket phones and vehicle mounted units, being introduced in Australia will take personal communications into the 21st century.

The high capacity cellular radio system with 600 channels at 800 MHz will begin in Sydney around December, be introduced in Melbourne by March 1987, and progressively spread to other areas.



DEADLINE

All copy for inclusion in the July 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 20th June 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x 220mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (No inquiries at office ... 11 Macken Street, Oakley). ***Closed for business during July.*** Agencies at: Geoff Wood Electronics, Rozelle, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

COMPLETE MANUAL OR CIRCUIT DIAGRAM: for Trio Model TR-2E tcvr for 2m. Brian VK2DHO, QTHR. Ph:(068) 62 2828.

RCA AR88D: must be complete & mech good cond. Brian Robertson, 32 Robert Street, Telopea, NSW. 2117. Ph: (02) 871 4863.

VALVE: 6GY6 or 6GX6 or 6HZ6, for Galaxy tcvr. VK2VJ, QTHR. Ph:(02) 750 0985.

YAESU FT-690R & FT-790R. Also accessories — YM-49, YM-50 mics, MMB mounts, FLC cases. Bob VK2CAN. Ph:(02) 265 8064 (BH) or (02) 46 3727 (AH).

WANTED — VIC

COMPLETE WORKSHOP SERVICE MANUAL: or photocopy of Siemens M100 (Series 1) teleprinter. Lyle VK3KLR. Ph:(03) 555 2601 (AH).

BEARCAT 210: or similiar. In good working condition. Ph:(03) 211 6406.

VALVES: 811A tubes, with sockets for use in a linear. VK3JM. Ph:(03) 221 4972.

WANTED — QLD

YAESU FT-901 DM, FV-901 DM, FTV-901: must be in A1 condition. Mick VK4VNN, QTHR. Ph:(071) 98 2282.

WANTED — SA

ROBLAN VARIABLE SINGLE GANG CAPACITOR: 10-415 pF. Brian. Ph:(08) 293 7027.

FOR SALE — NSW

BOOMLESS QUAD DUO-BAND: 10-15m, 2el. Complete with Braces, spreaders, coaxial transformers, etc. $125. Piezo Dynamic DX-344 desk mic. $60. All as new. VK2VRT, QTHR. Ph:(043) 41 7693.

COMMODORE 1525 PRINTER: In new condition. Suits VIC20, C64, C128, PET or any of the Commodore range. $350. Vicki VK2EVM, QTHR. Ph:(063) 68 2137.

EXCELLENT RADIO LOCATION: 15 min from Mudgee. 4 bedroom fibro cottage, 2 years old. Power, phone connected, school bus at gate. Set on 55 acres. Fully fenced with 3 dams. Includes 1 weekender, 2 x 5000 gal concrete water tanks & 1 x 1000 gal galv tank. 50 feet free-standing radio tower with 5el mono-band Yagi & 5-band ground plane on roof. $87 000 ONO. VK2EHF. Ph:(083) 73 5370.

HELIAX LDF4-50A: unused length of 8m for $65. Brand new set of 8 C-sized NiCAD batts @ $4.50 each. Ph: (02) 817 2652.

KENWOOD TR-9500 UHF ALL-MODE TCVR: In immac cond complete with mic, m/bracket, manual, no mods, no bugs. $500. Kenwood SW-100 UHF SWR meter to match above. $40. Max VK2GE, QTHR. Ph:(043) 92 4900.

KENWOOD TS-430S: F tx. All filters, FM board, workshop & operators manual, mic, Inc. 900. 25A H/B power supply. $100. MC-50 mic. $40. TS-430S workshop manual. $20. Shure 444D mic. $100. Shure 444 mic. $75. 5-500W Tandy SWR/PWR meter. $20. Drake TVI filter, 2kV rating. $20. H/B 10-15m, Yagi beam. $50. Ian Wilkinson VK2PKB. Ph:(049) 32 8935.

SHACK CLEARANCE: Icom 701 in mint cond with IC-701PS, desk & hand mics, manuals, just serviced by Icom. $600. Yaesu 227RB 2m rig, with scan mic, manual. $225. ATN144 Log periodic, 8el ant & Dick Smith mini-rotator with cable. $125. Professor Morse keyer & random Morse sender for practice to 50 WPM. $100. VK2AOO, QTHR. Ph:(063) 62 5977.

TRAPPED VERTICAL ANTENNA: V5JR for 10-80m (DSE D-4305). $60. Bob VK2CAN. Ph:(02) 265 8064 (BH) or (02) 46 3727 (AH).

VZ200 COMPUTER: P/S etc in orig packing with DSE RTTY interface + leads. $120 ONO. 16k VZ300 memory expansion in orig packing. $70. Programs — log, ant design, RTTY, CW, assembler, dis-assembler, etc. $10. The lot $170. VK2EVB, PO Box 433, Coffs Harbour, NSW. 2450. Ph:(066) 52 7160.

YAESU FT-757GX: $1100. AWA noise & distortion meter $200. Signal generator 45-180 MHz. $110. FM monitor/test rx 40-270 MHz. $80. Cavity tuned 4CX250 output stage 420-470 MHz. $75. Power supply for above. $90. Peter VK2CPK, QTHR. Ph:(02)238 7889 (BH) or (02) 411 1227 (AH)

FOR SALE — VIC

ASACA B&W CAMERA: with variable lens, circuits & books. Also monitor. Used for SSTV or security watch. Mint cond. $350. Ph: (03) 725 9285.

DAIWA 7600X HEAVY DUTY ROTATOR: with pre-set controller, never used; brand new. $350 ONO. Must sell. Steve VK3DQL, QTHR. Ph:(050) 37 2391.

HAMPAC MODEM III FOR APPLE COMPUTER: Complete with instructions & software. As new. $100. Andrew VK3KIR, QTHR. Ph:(03) 232 9649.

KENPRO ELEVATION ROTATOR: Type KR-500, 28V AC, new in box. $200. Rolex Airman's watch, Oyster Perpetual, SS GMT Master Superlative Chronometer, officially certified with Rolex Oyster Bracelet. Ex cond. $600 ONO. (new price $1590). VK3BRE, QTHR. Ph:(055) 62 6016.

KENWOOD TS-820S TCVR: with MC-50 mic in ex cond. Very little use. $500. Craig VK3NAG. Ph:(03) 397 5287.

KW TR-9130 MULTI-MODE 2m TCVR: c/w BO-9 base stand. Ideal for satellite use. Ex cond. $500. VK3APT, QTHR. Ph: (054) 28 6516 (AH).

FOR SALE — QLD

TELEPRINTER MODEL 15 ON TROLLEY: includes loop supply & modem. Has selectable BAUD rate, shift, polarity, UART regenerator & all circuit diagrams. $75 ONO. Ross VK4ARG. Ph:(07) 376 6452 (AH).

YAESU FT-501 TCVR: 400W PEP digi readout. Completely over-hauled including new driver & finals. $525. Yaesu 2 & 6m transverters to suit 101E. $220 each. Mick VK4VNN, QTHR. Ph:(071) 98 2282.

YAESU FT-902D HF TCVR: including hand mic, power lead & operation manual. $600. Also IC-202 2m SSB tcvr with OSCAR xtal, hand mic & documentation. $100. Steve VK4AWO, QTHR. Ph:(070) 91 1435.

FOR SALE — SA

ATTENTION — AN EME ENTHUSIAST: Owing to work load limitations place on me due to back injury, I must sell my partially completed EME installation for part of its full value. 24 x 16' aluminium pop rivetted trusses shaped & assembled ready to make 32' parabolic (dish) antenna with f/d 0.45 & 31 dB projected gain on 70 cm. 1296 MHz gain well over 40 dB. All ⅞" al tubing, vertical supports end notched, gusset plates & monel rivets. Half completed central hub assembly (welded steel industrial tubing). Solidly constructed reverse rib truss & separate precision axle for testing shape of parabola. On hand materials include 3 rolls ½" square welded & galv steel mesh to cover dish; ⅜" al tubing to complete concentric rings; enough ⅞" al & 1" steel tubing to probably complete construction; 4'6" turntable for azimuth movement complete with shafting, gear-box, & 240V motor; assembly equipment inc rolling mill for shaping aluminium, notching machine, 96 SS bolts for central hub, quantity pop rivets, gusset plates, etc. Also 16' 4-leg tower for mounting dish (needs to be cut from concrete base) made from heavy angle steel, rust treated & undercoated. All above $2900 cash. (An array of 16 x 16 el antennas with power dividers, rotators, mast, H frames, cross arms, phasing lines, etc would cost around $5000 & still be 5 to 6 dB lower in gain than this dish). Also electronic equip avail for sale after dish is sold — first offer to buyer of dish. K2RIW 1000W 70 cm amp, parts to construct 2 kV power supply, Drake R4B rx & T4XB tx, blowers, Rustrak chart recorder, dB meter, MM 1296 MHz transvarter plus 100W 1296 MHz tx (ex VK2BQJ), spare valves & other parts. Eric Jamieson VK5LP, QTHR. Ph:(08) 389 1204 Inspection by appointment only.

SIEMANS MODEL 100 TELEPRINTER: with local & tape tx & rx. Comes with 2 rolls of paper, a roll of paper tape, & new ribbon. All documentation incl. $60 ONO. Mike VK5AEK. Ph:(08) 339 4959.

YAESU YD-148 DESK MIC: new & unused 8 pin. $35. SWL antenna tuner, home brew. $25. Teak Computer Desk, new. $70. 20 new, unused floppy disks. $50 the lot. Charlie VK5YC. Ph:(08) 258 0320.

Advertiser's Index

AIMING HIGH WITH COMMUNICATIONS ACCESSORIES FROM GFS

WAY OUT FRONT IN AIRBAND PORTABLES THE NEW ATC-720X

- BALLOONISTS
- AERO CLUBS
- HOME BUILTS
- EMERGENCY COMMS
- RESCUE OPS
- ULTRA LIGHTS
- GLIDERS
- AIRPORT SECURITY
- HANG GLIDERS
- AIR SHOW COMMS
- EXPERIMENTAL

920 CHANNEL NAV COM — PLUS 4 MEMORY SCAN PORTABLE TRANSCEIVER

The New ATC-720X provides inexpensive airband communications for a wide range of applications. Its most important includes promoting the peace of mind which comes from knowing you have an emergency back-up transceiver with you. It is supplied complete with rubber antenna, alkaline batteries and carrying strap **$749** + S.T. + $14 P&P **$859 Inc S.T.**

AR-2002 Continuous Coverage 25-550, 800-1300 MHz Scanner

If you want continuous coverage AM/FM wide & narrow with 20 memories we suggest you choose the AR-2002 from GFS

$799 + **$14 P&P**

AR-88232 Computer Interface for AR-2002 $499 + $8 P&P

LOW LOSS FOAM DOUBLE SHIELDED COAXIAL CABLE

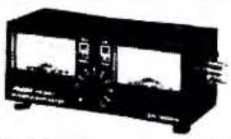
LOSS IN DB/30 METRES

TYPE	100 MHz	200 MHz	400 MHz	900 MHz
5D-FB	1.86	2.70	3.90	6.00
8D-FB	1.20	1.74	2.58	3.90
10D-FB	0.99	1.44	2.10	3.30
12D-FB	0.84	1.23	1.80	2.79
RG-8/AU	2.20	3.20	4.70	8.00
LDF-450	0.75	1.40	1.80	2.50

FB SERIES CABLE & N CONNECTORS

CABLE		N-CONNECTORS	
5D-FB	$2.90m	NP-5DFB	$12.00 ea
8D-FB	$4.20m	NP-8DFB	$12.40 ea
10D-FB	$6.30m	NP-10DFB	$12.90 ea
12D-FB	$8.70m	NP-12DFB	$13.70 ea

HG-VHF SWR-POWER METER



Compact, two power ranges, 0-12 Watts & 0-120 Watts, switchabel HF-VHF with lighted meter. **$65 plus $8 P & P**

NEW HS-VK5 5 BAND HF VERTICAL

Fully self supporting & complete with self supporting loaded radials. **$299 and $14 P & P**

NEW BROADBAND OMNIDIRECTIONAL ANTENNA 25 TO 1300 MHZ

The new D-130 is one of the latest generation full coverage HF/VHF/UAF omnidirectional antennas. It provides continuous operation from 25 to 1300 MHZ and is ideally suited to the likes of the AR-2002 or the ICOM ICR-7000 scanning receivers.

PRICE $229 plus $14 P & P

QUALITY CERAMIC EGG INSULATORS NOW AVAILABLE AT GFS

Search no more for those hard to get ceramic egg insulators, GFS. have now secured a reliable overseas service. **CAT E-GG $1.50 ea. or $12 for 10. Plus $4 P&P**

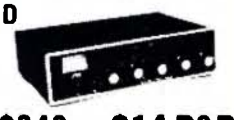
SCAN THE BANDS WITH OUR MICROCOMM SX-155 PROGRAMMABLE POCKET SCANNER

This new unique scanner provides coverage of 26-32, 68-88, 138-176 and 380-514 MHz with a sensitivity of less than 0.5 uV. Four banks of 40 memory channels, total of 160 memories. High scan speed of 16 CH/SEC. Auto search and store mode. Priority channel. 4 hour life on supplied Nicad batteries. 24 hour clock. Selectable Scan/Search delay of 0, 1 or 2 seconds. Includes Nicads, charger, carrying-case and antenna.

$449 + $14 P & P

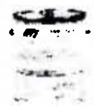
ANTENNA MATCHER FOR CONTINUOUS HF COVERAGE-MFJ-941D

Apart from being extremely versatile the MFJ-941B includes a 6-position coax-switch, SWR power meter, 4:1 Balun and will feed balanced line, single wire and coaxfeed antennas.



$349 + $14 P&P

2 KW DUMMY LOAD



MFJ-250 Low SWR to 400 MHz, 2 KW PEP, supplied with transformer oil.

$99 + $14 P & P

EXPANDED RANGE OF HF-VHF-UHF ANTENNAS

BROADBAND ANTENNAS

LOG SP — 65 to 520 MHz
$199 + $14 p&p
LOG S 100 to 520 MHz
$139 + $14 p&p

BROADBAND OMNIDIRECTIONAL ANTENNAS FOR SCANNERS

GDX-1 16 element discone 80-480 MHz suits transmitters and receivers.

$145 + $14 p&p

SCAN-X: 6 element discone for receive applications 85-520 MHz.
$92 + $14 p&p

HF BROADBAND DIPOLES

New T2 FD series provides continuous HF coverage

200 WATT MODELS

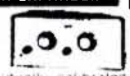
3.5-30 T2-FD-200 is 25m long, 3.5-30 MHz
1.8-30 T2-FD-200 is 30m long 1.8-30 MHz both **priced at $171 + $14 p & p**

2KW MODELS

3.5-30-T2-FD-2KW is 40m long 3.5-30 MHz
1.8-30 T2-FD-2KW is 50m long, 1.8-30 MHz both **priced at $228 + $14 p & p**

RF NOISE BRIGE WITH BUILT IN EXPANDER

MFJ-202B



These individually calibrated noise bridges read both inductive & capacitive reactance over a much wider range than the others. Simple to use and covers 1 to 100 MHz **$199 + $14 P&P**

FOR THE RTTY OPERATOR

MDK-17 (KIT) MOD-DEMOD

A high performance RTTY/CW modem kit for use on a computer or teletype. Offers high noise immunity on receive **$142 + $6 p&p (kit) or $219 $8 p&p (assembled).**

Versatile RTTY/CW modem, interfaces with a computer and is supplied with software for VIC-20 or Commodore-64 **$365 + $14 p&p**

NOW AVAILABLE ELECTROPHONE 27 & UHF. CB

We now stock the popular range of electrophone CB transceivers. For a competitive price and helpful information on which model to use for your application give us a call or simply drop in.

Great Circle Map

Now point your beam in the correct direction using this Great circle Map! centred on Melbourne **$2 + $3 P&P**

What is stronger than wire of equivalent cross section, non corrosive, non conductive and has virtually no elongation?

NEW DEBEGLASS WIRE

Now guy your tower without having to break the wires with dozens of egg insulators, or worrying about them corroding away due to a salty atmosphere. Our Debeglass wire alternative is made using continuous filament fibreglass yarn, jacketed in UV stabilized vinyl chloride. Compare the figures below

	DB-4 (4mm)			DB-5 (5mm)		
	Core diam (mm)	Wt of 200mm (gm)	Tensile Str (kg)	Core diam (mm)	Wt of 200mm (gm)	Tensile Str (kg)
Debeglass	2.5	3.9	430	3.0	[illegible]	560
Steel wire	2.5	5.6	370	[illegible]	[illegible]	[illegible]

DB-4 (4 mm) $0.55m DB-5 (5 mm) $0.78 DB-6 (6 mm) $1.30 Debeclip Termination Clip to Suit DB4, DB5, DB6 $4.95 each

GFS electronic imports

AUSTRALIAN DISTRIBUTOR
GFS ELECTRONIC IMPORTS
Division of Deribar Pty. Ltd.

17 McKeon Road, Mitcham, Vic. 3132
PO Box 97, Mitcham, Vic. 3132
Telex: AA 38053 GFS
Phone: (03) 873 3777 3 Lines

ICOM IC-R71A

The Best Just Got Better

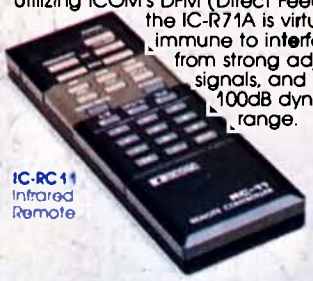
IC-GC4
World Clock

ICOM introduces the IC-R71A 100KHz to 30MHz superior-grade general coverage receiver with innovative features including keyboard frequency entry and wireless remote control (optional).

This easy-to-use and versatile receiver is ideal for anyone wanting to listen in to worldwide communciations. Demanding no previous shortwave receiver experience, the IC-R71A will accommodate an SWL (shortwave listener), Ham (amateur radio operator), maritime operator or commercial operator.

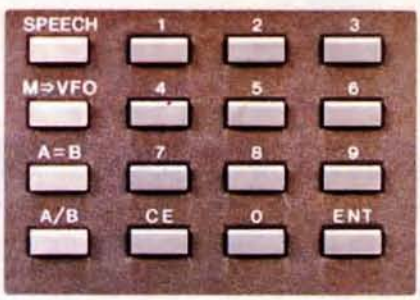
With 32 programmable memory channels, SSB/AM/RTTY/CW/FM (optional), dual VFO's, scanning, selectable AGC and noise blanker, the IC-R71A's versatility is unmatched by any other commercial grade unit in its price range.

Superior Receiver Performance. Utilizing ICOM's DFM (Direct Feed Mixer), the IC-R71A is virtually immune to interference from strong adjacent signals, and has a 100dB dynamic range.



IC-RC11
Infrared
Remote

Passband tuning, a deep IF notch filter, adjustable AGC (Automatic Gain Control) and noise blanker provide easy-to-adjust clear reception, even in the presence of strong interference or high noise levels. A preamplifier allows improved reception of weak signals.



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Amateur Radio

VOL 54, No 7, JULY 1986

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

1986 RD Contest Rules

Antenna Activities

WIA Convention Report

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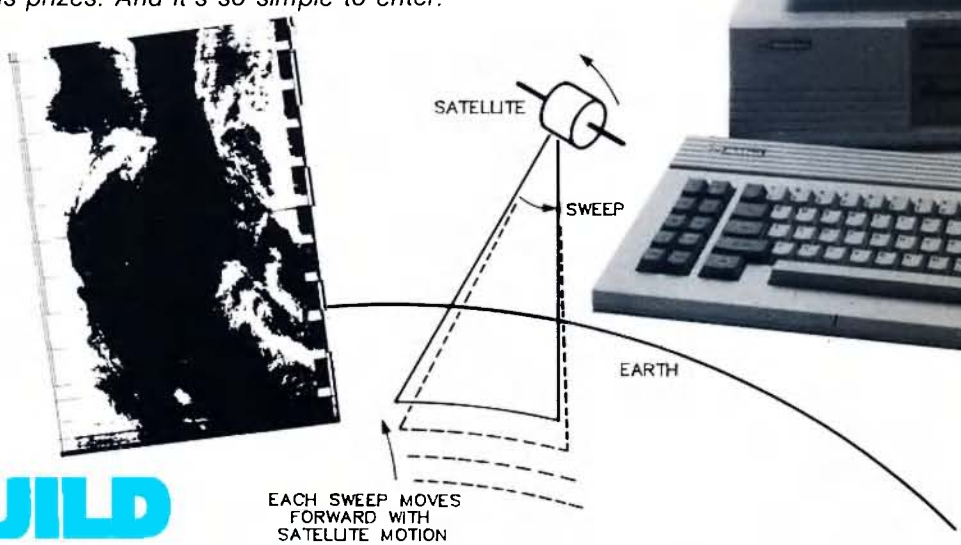

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Amateur Radio

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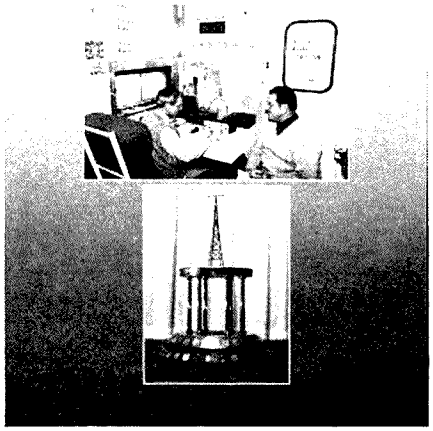

Left: George VK5AGK, transmitting at Angaston in the Barossa Valley, while Norm VK5ZAH, logs the contacts. George and Norm were operating aboard the Jubilee Industry Trade Train. See page 23, June AR.
Photograph courtest Peter Wegener VK5AWP, of the Barossa Valley Radio Club

Inset: The Remembrance Day Trophy which is presented to the winning Division after the contest results are announced. See Contest Column for a history of the Trophy.
Photograph by Ken McLachlan VK3AH

Technical Features

Special Features

Regular Features

The Remembrance Day Contest is the *Big One* on the VK Contest Calendar, and it is almost that time of year again. This month's Contest Column features the rules for the 1986 Contest. Ian VK5QX, also takes some time to explain the reasons for this Contest and gives an insight into the life of the RD Trophy.

It is always interesting to look ahead and wonder what life will be like a decade or so ahead from the present. Alan VK4SS, the VK4 Historian, looks at the year 2036. Alan located an article in a 1936 *Amateur Radio* and it is interesting to read what the writer considered how amateur radio may be, 50 years hence when one considers how the majority of radio equipment was home-brew in 1936.

Tony G4FAI, AR's correspondent in London, has written to say that VHF and UHF licensees in Britain now have permission for Morse transmissions as a permanent feature of their licenses. Last year, an experiment was held whereby temporary variations of the Class B licence were issued and this experiment has proved so successful that the DTI has granted the concession as a permanent feature, page 25.

Impossible to work 42 countries on six metres from Australia? No. Eric VK5LP, includes the full listing of the 42 countries worked by VK8GB, on six metres from Darwin and also includes the dates of the initial contacts so you may check your logs and see how conditions were on six from your QTH on the particular dates.

DEADLINE

All copy for inclusion in the September 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 21st July 1986.

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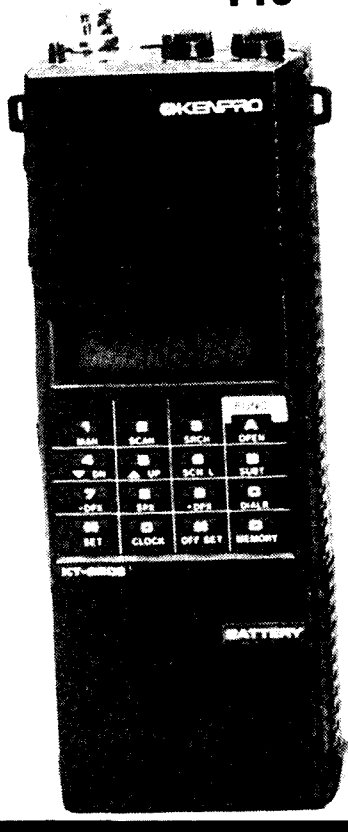

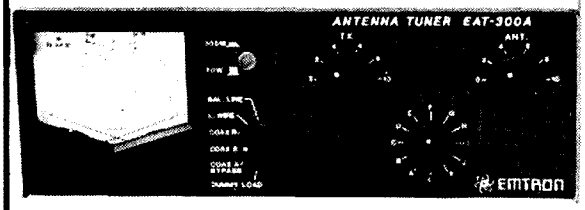

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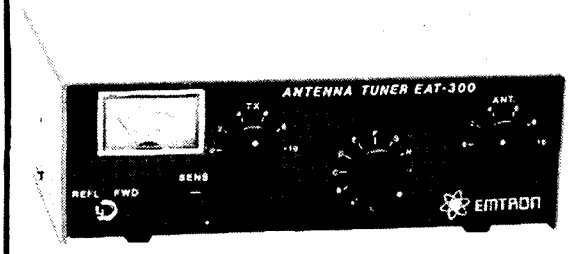

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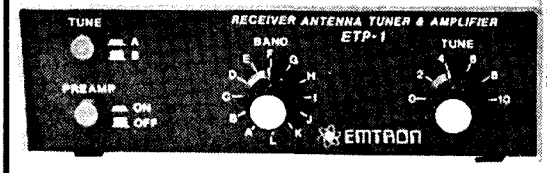

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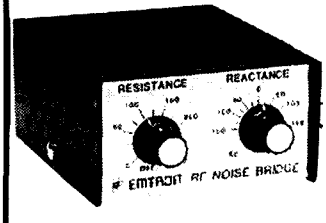

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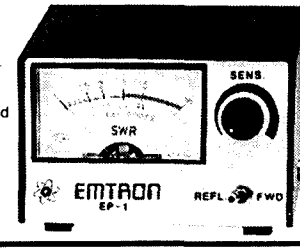

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Editor's Comment

1986 — A Rather Special Year

Those of you who take the trouble to read these bursts of vaguely relevant verbiage have probably noticed that every so often I have pointed out historical occurrences of interest to us as radio amateurs. The editorial banner has had titles in the past such as "More History" and "More Anniversaries". And now I am impelled to do it again! This year of 1986 has not only been distinguished by the return of Halley's Comet, regrettably not as a spectacular as in 1910, but by several other notable anniversaries as well.

Firstly, as our colleagues in VK5 are reminding us so well, this is the sesquicentenary of the State of South Australia. All this year we have the opportunity to work VK5JSA, and VK5s generally, towards the acquisition of the Jubilee 150 Award. The full details were published last October. This is only one of many amateur activities, and State-wide celebrations as well, which will reach their peak on 28th December, the 150th anniversary of the Proclamation of the Colony of South Australia by its first Governor, Captain John Hindmarsh of the Royal Navy.

Exactly half as old as South Australia, our own Royal Australian Navy is this year celebrating its 75th birthday. The WIA is just over one year older, and evolving together as they have, the two organisations have always shared a common interest in radio communication, albeit from somewhat different viewpoints. Many of our members were or are members of the Navy also, their amateur radio interests no doubt contributing to their professional competence. There is at least one Admiral among our ranks!

Fifty years ago, on 2nd November 1936, the world's first regular public television broadcasts began, from the Crystal Palace, London. The expansion of television since then has been truly fantastic in all respects, technical, information and entertainment. Global television coverage of almost everything has become commonplace, bringing us all much closer to that "one world" of which many have dreamed for centuries. Australia joined this electronic extravaganza just 30 years ago, towards the end of 1956. And both here and elsewhere, there is probably no television broadcasting system which does not have a number of radio amateurs among its staff.

Finally, 1986 has brought us the 25th anniversary of manned space flight, from the intrepid orbit of Yuri Gagarin to the near-routine space laboratories of today. Not quite routine yet, nor is every engineering detail perfected, as was so tragically demonstrated by Challenger only a few months ago. The lessons learned from that catastrophe will never be forgotten. As always in human progress, success is built on failure. We may be sure that future Shuttles, and later spacecraft, will again carry radio amateurs with whom we, earthbound, may converse. Even more surely, some of the engineers and technicians who make space safe again will be our fellow amateurs. Times like this special year of 1986 give us good cause to reflect and be perhaps a little proud!

Bill Rice VK3ABP
Editor
ar

MODIFYING THE ICOM PS-15 POWER SUPPLY

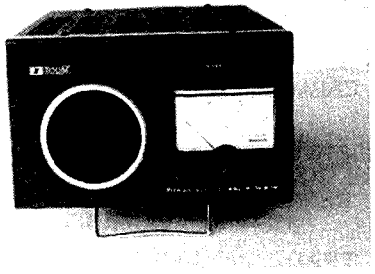
Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

The Icom PS-15 is an excellent power supply but it has two limiting factors. Firstly, there is no AC power switching, this being accomplished from the matching transceiver, and secondly, there is no auxiliary DC output.

In a recent review of the new 735HF transceiver, I mentioned that I had modified my PS-15 to overcome these limitations. Several amateurs wrote to me asking just how this was accomplished, so here is the story.

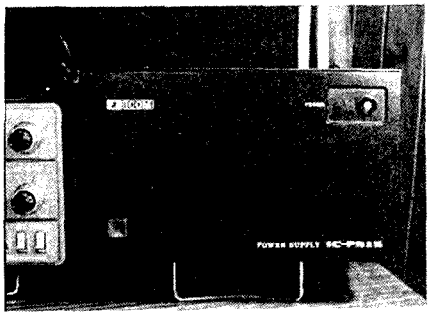
If you have a PS-55, the matching AC supply for the 735 transceiver, I am sure a similar modification could be done. However, I have not done this, so the details are up to your imagination.

The story is best told by the photographs of the two power supplies which have been modified thus far.



The PS-15 Power Supply as modified by Reg VK3CCE.

The first one I did provided for the two above requirements, whilst the second, modified by Reg VK3CCE, also included a loud speaker and a DC ammeter. It is a strange thing that neither Icom or Kenwood incorporate a speaker in their DC power supplies. I guess if they did it would be unnecessary to but the matching speaker!



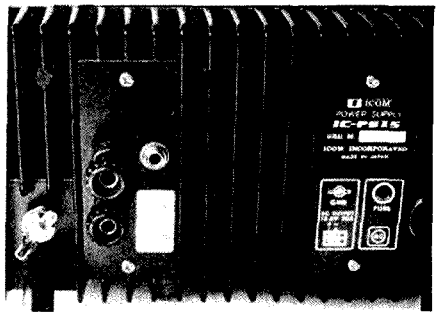
The PS-15 showing the added AC switch in the bottom left-hand corner.

For the basic modification, both the switch and terminals are available from Dick Smith. The AC switch used is a push on/push off type, and it matches the front panel perfectly. Before drilling the mounting hole, remove the front panel from the power supply cabinet and place it on a firm flat surface. The panel is secured by eight screws around the edge.

The switch is wired in parallel with the existing switching connection that goes to the transceiver. This enables the power supply to be switched in the normal manner from the transceiver or if any auxiliary piece of equipment is to be used, from the power supply.

The DC output terminals are mounted on the left-hand cover plate at the rear of the supply and the DC leads are routed down through the slots in the heat sink, then up through a couple of ventilation holes at the bottom rear of the cabinet.

The negative lead should go to an earth point and the positive lead it the regulated output point on the vertical board. The



The rear view showing an auxiliary DC output terminal, also the 3.5 mm socket for speaker connection.

photograph also shows a 3.5 mm socket for the internal speaker added to the second version.

My PS-15 now runs the whole station, an IC-745 transceiver, a TS-430S transceiver (but not both together on transmit), and a TR-7950 45 watt two metre FM transceiver. If you have a clutter of power supplies on your bench, try this simple, but effective modification. Maybe the next model Icom supply may even have included something similar.

ar

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Abridged from Electronics News, p23 — April 1986

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Federal Secretary
Wireless Institute of Australia
PO Box 300
CAULFIELD SOUTH VIC 3162

Dear Sir

I refer to my letter of 24 April 1986 in which I indicated that the time limit applied to exemptions for partial examination qualification was to be removed.

You will recall that, since November 1982, persons who obtained partial qualification at examinations for amateur certificates of proficiency have been granted a two year exemption in those subjects passed. I am pleased to advise that this situation has been reviewed and that the two year limit no longer applies.

As from 18 February 1986, all candidates who obtain partial qualification at amateur examinations are granted permanent exemption in those subjects passed. A permanent exemption is also extended to those persons who at the time of the February 1986 amateur examination (i.e 18 February 1986) possessed a valid exemption under the previous 2 year provision.

The responsibility for demonstrating to the Department that a part qualification was previously obtained rests with the applicant. Original documents must be supplied at the time of application for a certificate of proficiency, copies will not be accepted.

It would be greatly appreciated if you could arrange for the information outlined to be promulgated in the normal manner available to the Institute.

Yours sincerely

D Hunt
Manager Regulatory
Operations Branch
Radio Frequency Management Division
Canberra

23 May 1986

A MULTI-BAND DIRECTIONAL ANTENNA

The following extract is from an original article by E Gutkin UB5CE, and was translated from RADIO Nos 1-3 1985, by Robert Hancock VK5AFZ. It details the construction and electrical characteristics of a multi-band antenna system comprising 10, 15 and 20 metres interlaced Yagi- type beams and a 40 metre dual active radiator wire antenna as shown in Figure 1.

The 7 MHz elements are supported by insulating extension sections on the ends of the 14 MHz reflector and director elements. Upright rods, with egg type insulators, support the top of the radiating elements in a truncated rhombus configuration.

The lengths of D7 and R7 for the design frequency of 7.050 MHz are 21.7 and 22 metres respectively, consisting of two symmetrical halves as shown in Figure 1. The dimensions of the other elements are in Table 1.

Feedline matching to the Yagi elements is by means of T-match sections as shown in Figure 2. Dimensions of the T-match constructions are shown in Table 2 (all dimensions are in millimetres).

Matching to the 7 MHz elements is carried out with a symmetrical auto- transformer and capacitor network, as shown in Figure 3. The auto- transformer is wound in four parts, twisted together on a ferrite core (Russian type

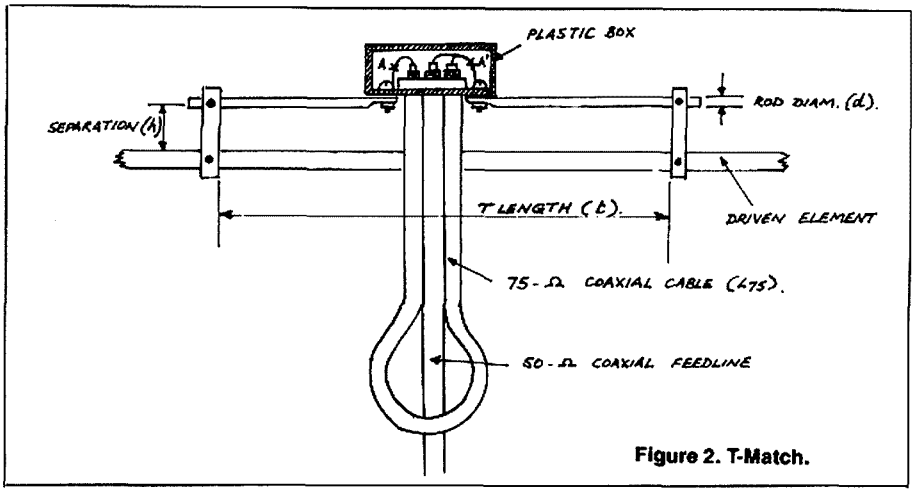


Figure 2. T-Match.

Table 1.

ELEMENT	LENGTH in mm	SYMBOL (Fig 1)
14 MHz Director	9330	D_{14}
14 MHz Driven Element	10180	A_{14}
14 MHz Reflector	10480	R_{14}
21 MHz Director	6550	D_{21}
21 MHz Driven Element	7020	A_{21}
21 MHz Reflector	7220	R_{21}
28 MHz Director	4640	D_{28}
28 MHz Driven Element	5330	A_{28}
28 MHz Reflector	5180	R_{28}

Table 2. T-Match Dimensions (Refer Figure 2).

BAND	T-LGTH (t)	ROD DIAM (d)	SEPARATION (h)	75 ohm SECT L 75)
14 MHz	1160	8	140	6980
21 MHz	1660	8	80	4680
28 MHz	1150	30	75	3400

The 14 MHz matching section has two 130 pF capacitors inserted at points A and A1.

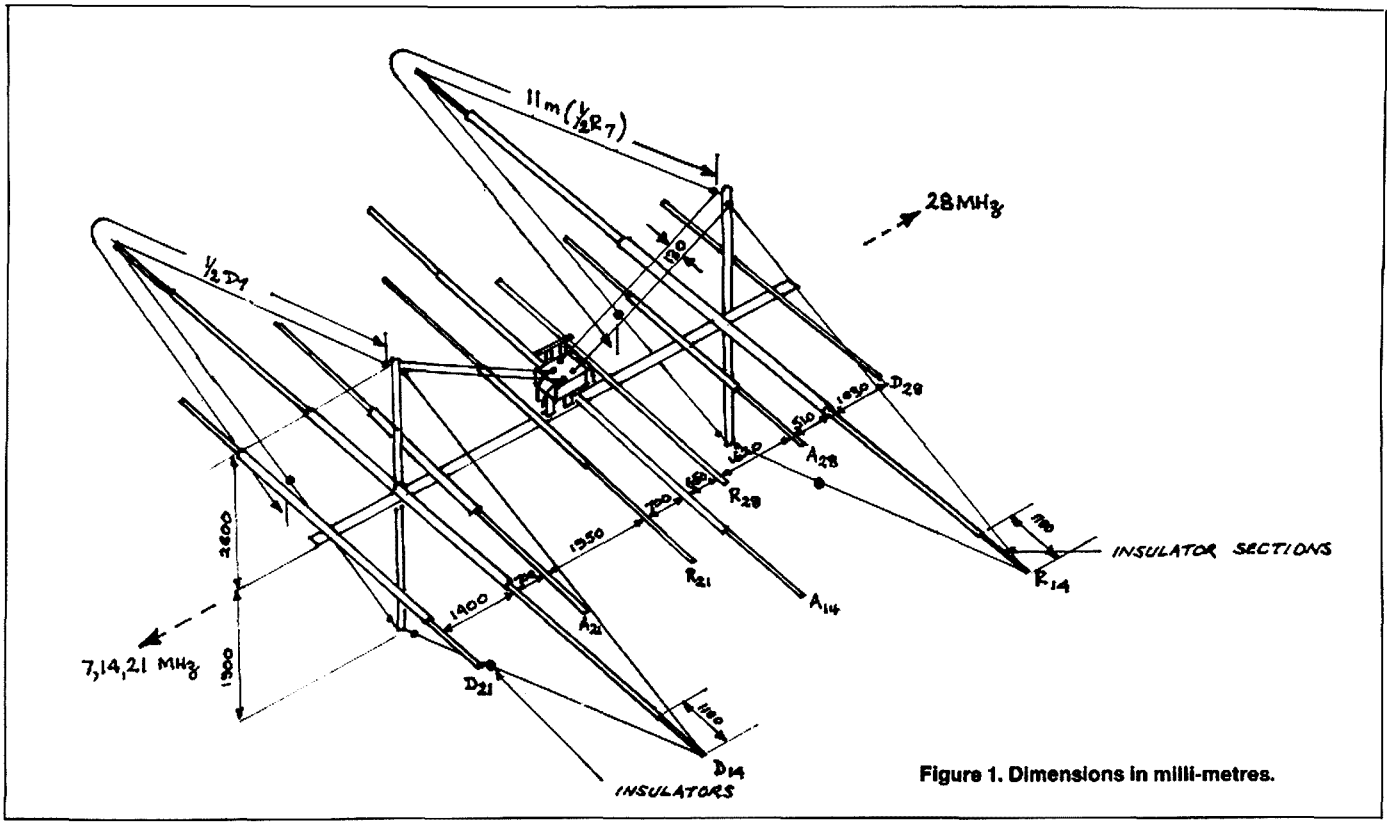


Figure 1. Dimensions in milli-metres.

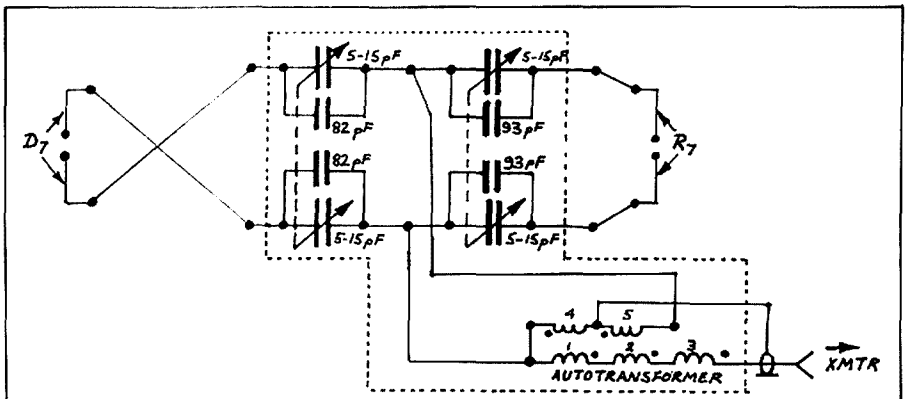


Figure 3. Matching Network.

50 VCh, K32x16x8 — other details unknown). The winding is constructed by twisting together 12 multi-wire cables of one millimetre diameter in PTFE insulation and forming four turns on the toroidal core. The ends are connected as in the circuit diagram making sure to use minimum lead lengths to maintain a compact construction.

The auto-transformer has 16 turns in the output section and eight on the input section, giving a transformation coefficient of 0.5. This may be increased if necessary by reducing the number of windings on the output section, eg 15 turns equals 0.533, 14 turns equals 0.57.

Each of the tuning capacitors consists of a 5-15 pF variable plate condenser in parallel with a fixed capacitor (82 pF for the director and 93 pF for the reflector). The matching unit is housed in a plastic box 150 x 100 x 50 mm internal dimensions.

Table 4. Directional Characteristics of 7 MHz Antenna.

AZIMUTH	REL POWER %	AZIMUTH	REL POWER %
30	75	195	6
60	25	210	2
75	10	225	3
90	10	240	10
105	13	255	11
120	10	270	10
135	5	285	10
150	3	300	23
165	7	330	75
180	8	0	100

The directivity pattern of the 7 MHz antenna is shown in Table 4.

NOTE: The above article was translated by Robert Hancock VK5AFZ, 30 Tottenham Court Road, Port Elliot, SA. 5212. If any readers would like further explanations of the article please write to Robert, please include an SASE.

ar

WHERE DO I BEAM?

Ian Crompton VK5KIC
9 Craig Street, Richmond, SA. 5033

The following program was written for the TI-59 calculator, but it should easily convert to other programmable units.

Just what *is* the distance between your station (or receiver) and the station you're working (or receiving)? No! Not the road distance, the direct shortest distance which shows up on a Mercator Projection map, such as a Great Circle Distance. What heading would the beam best be set to?

Both questions can be answered by this program!

The formulae are:

Distance (in degrees of latitude) =

arc cos [sin (lat$_t$) sin (lat$_r$) +

cos (lat$_t$) cos (lat$_r$) cos (lng$_r$-lng$_t$)]

To convert this to nautical miles, multiply by **60**, to Statute (ordinary) miles, multiply by **68.98**, to kilometres by **111**. I couldn't track down these conversion factors after the first in my books, so had to work them out!.

$$\text{Beam Heading} = \arccos \frac{\sin(\text{lat}_h) - \cos(\text{distance in degrees}) \sin(\text{lat}_t)}{\text{sine (distance in degrees) cos (lat}_t)}$$

If the sine of lng$_t$-lng$_h$ is < **0**, then heading is **360**-heading calculated.

Eastern longitudes and southern latitudes are entered as negative, western longitudes and northern latitudes are entered as positive.

Coding for the TI-**59** calculator follows. Writing these formulae up in BASIC for a home computer does not seem too great a programming challenge. In these formulae, latitude and longitude of your transmitter or receiver are abbreviated as lat$_t$ and lng$_t$, and latitude and longitude of the station heard by lat$_h$ and lng$_h$.

In the program which follows, lat$_t$ is stored in memory-one, lng$_t$ in memory-two, lat$_h$ in *memory-three*, lng$_h$ in memory-four. Distance (in degree format) is stored in memory-five.

Heading as calculated is stored in memory-seven while the test following the calculation is performed.

In many cases, the only information available about latitude and longitude of transmitter/receiver location or of the station heard location will be found expressed in degrees and minutes from the Gazetteer of an atlas.

This program converts the angle from the degree-minute-(second) format to the decimally-divided format used in calculation before storing it in memory.

Enter TX/RX latitude in ddd.mm(ss) form into display, Key A accesses a subroutine which converts this format into decimally-divided degrees before storing the result in memory-one.

Then enter TX/RX longitude (lng$_t$) into display in ddd.mm(ss) form, then into memory-three using the program on Label B.

Station heard latitude and longitude (lat$_h$ and lng$_h$) are put into memory-three using C and memory-four using D.

Distance is calculated by subroutine labelled E, and heading by a subroutine labelled E'.

Before using the program, enter TX/RX latitude into the display at this point. The latitude is keyed in in ddd.mm(ss) form.

Coding	Comment
000 76	
001 11	Label A
002.88	converts from ddd.mm(ss) form into decimally-divided
003 42	degrees form
004 01	store in memory-one
005 92	end of subroutine, restores control to keyboard.
	Key in lng$_t$, the longitude of transmitter or RX site.
006 76	Label B, used to enter TX/RX longitude, lng$_t$
007 12	
008 88	converts from ddd.mm(ss) form to decimal° form
009 42	
010 02	store in memory-two
011 92	end of subroutine, restores control to keyboard.
012 76	
	Key in latitude of station heard in ddd.mm(ss) form. Enter using procedure
013 13	under Label C
014 88	converts latitude from ddd.mm(ss) form to decimal° form
015 42	
016 03	store in memory-three
017 92	end of subroutine
	Key in longitude of station heard)lng$_h$ in ddd.mm(ss) form
018 76	
019 14	Label D
020 88	converts from ddd.mm(ss) form to decimal° form
021 42	
022 04	store in memory-four
023 92	end of subroutine.
024 76	
025 15	Label E for the Distance calculation
026 53	(
027 53	(
028 43	
029 01	recall memory-one, TX/RX latitude
030 38	take its sine
031 65	multiply by
032 43	
033 03	recall memory-3, station heard latitude
034 38	take its sine
035 54	)
036 85	+
037 53	(
038 43	recall TX/RX latitude
039 01	
040 39	take its cosine
041 65	multiply by
042 43	
043 03	recall station heard latitude
044 39	take its cosine
045 65	multiply by
046 53	(
047 43	
048 04	recall longitude of station heard
049 75	minus
050 43	
051 02	recall longitudes of TX/RX site
052 54	)
053 39	take cosine of result
054 54	)
055 54	)
056 22	
057 39	arc cosine
058 42	
059 05	store distance in degrees' in memory-five
060 92	end of subroutine
	to get distances in nautical miles, Statute (ordinary) miles, or kilometres, multiply the contents in memory-five by the appropriate factor. That was being done, in a lengthy way, in the gap in the program here.
073 76	Label E', used to calculate the heading, given
074 10	the input data and the value just calculated.
075 53	(
076 53	(
077 43	
078 03	recall station heard latitude
079 38	take its sine
080 75	minus
081 53	(
082 43	
083 05	recall memory-five, distance just calculated
084 39	take its cosine
085 65	multiply by
086 43	
087 01	recall TX/RX latitude
088 38	take its sine
089 54	)
090 54	)
091 55	divide by
092 53	(
093 43	
094 05	recall distance in degrees'
095 38	take its sine
096 65	multiply by
097 43	
098 01	recall TX/RX latitude
099	take its cosine
100 54	)
101 54	)
102 22	
103 39	arc cosine
104 42	
105 07	store result in memory-seven
106 00	
107 32	put 0 into test register
108 53	(
109 43	
110 02	recall TX/RX longitude
111 75	minus
112 43	
113 04	recall station heard longitude
114 54	)
115 38	take sine of result
116 22	
117 77	test if < **0**
118 01	
119 25	if so, go to **125**
120 43	
121 07	recall calculated heading
122 92	end of subroutine
123 68	no operation (filling!)
124 68	no operation (filling!)
125 43	
126 07	recall calculated heading
127 94	change sign
128 85	plus
129 03	
130 06	
131 00	
132 95	**360** =
133 92	end of subroutine, end of calculation

Following are two examples:

Moorabbin to Yarrum	Display
Enter latitude of Moorabbin	-37.59
Press A	-37.98333333
Enter longitude of Moorabbin	-145.12

Press B	-145.2
Enter latitude of Yarrum	-38.35
Press C	-38.58333333
Enter longitude of Yarrum	-146.45
Press D	-146.75
Press E to calculate distance in 'degrees of latitude'	1.343477858
The same as 150.6 km	
Press E' to calculate heading	116°

Moorabbin and Stawell	Distance
Moorabbin values are in memories one and two	
Enter latitude of Stawell	-37.05
Press C	-37.08333333
Enter longitude of Stawell	-142.47
Press D	-142.78333333
Press E to calculate distance 'in degrees'	2.096718201
in kilometres 235.0	
Press E' to calculate heading	294°

ACKNOWLEDGMENTS: Hewlett Packard for including this among their Standard Pac series of programs for their HP-65. TAB Books for publishing it as one of many items in their "Advanced Applications for Pocket Calculators."

JUMBLED? ? ?

Unfortunately, one line of Novice Notes, page 25, June issue got completely jumbled at the printers. The offending line is the first line, bottom right hand corner. This line should be at the bottom of the second column, same page.

The paragraph should read thus:

If only low power operation is contemplated, C1 may be an ordinary dual-gang broadcast capacitor. These are not too difficult to find. For higher power work, C1 must have wide spaced vanes. A dual-gang 200 or 250 pF unit would be fine for this. C2 may be a dual-gang 415 pF BC type, even for power levels to the legal limit. The shafts of these two capacitors are nominally at RF earth potential, so no special insulating precautions are necessary.

Please delete the offending line, right hand side, below Figure 4:

Apologies are extended for the confusion caused.

QSP

VOYAGE OF ST JUPAT

According to reports, the two young Hungarian engineers, Nandi and Joe, who are on a round-the-world navigational trip, (see initial report in AR, February, page 16), were expected to sail into Sydney Harbour on about 20th May 1986.

They left Capetown, South Africa, on 12th March 1986. Their sailing course along the Roaring 40s took them steadily eastward. They have battled huge seas, dampness, the sea-water and salt, sea-sickness, shortage of fresh food and they even had problems with a poorly functioning generator which is used to charge their radio batteries. They were no doubt glad to set foot again on *terra-firma*.

On board the 30 feet, four ton (9m, 4 tonnes) vessel they have a small FT-7, 50 watt amateur radio station which they use with the call sign HG4SEA/MM, however, it was only in early May that regular radio contact with them was established.

ZL1BIM, from Auckland, New Zealand, has been supplying them with up-to-date detailed weather reports on their regular daily scheds on 14 MHz. Roger VK2XJ, Peter VK2OG and Steve VK2PS have also been in daily contact with them on the 20, 40 and 80 metre amateur bands.

The duo intend to stay in Sydney for a few months to attend to the necessary maintenance and repairs to their boat and equipment.

Weather and winds permitting, they will then continue across the Pacific towards the Americas.

Hopefully, we will have a full report of the boys arrival at Sydney in the next issue of AR.

Contributed by Stephen Pall VK2PS

AIRCRAFT RESTORATION

Keith Muller
C/o Department of Aviation,
PO Box 24, St Marys, NSW. 2760

Probably in years to come, arguments will arise as to which aircraft was the best in air battles of the Second World War. With such a variety of operational requirements, that argument may never be resolved, although one aircraft did stand out in a number of aspects.

Enter the *De Havilland MOSQUITO.* Constructed of Balsa wood sandwiched between wooden ply layers, powered by a pair of the remarkable *Rolls Royce MERLIN* engines, it was fast and manageable. It carried a considerable bomb load for its size, was used as a bomber, fighter, photo reconnaissance, night fighter and passenger carrier.

It was used by the navy as the *SEA MOSQUITO* and six different air forces. It was deployed as far afield as Asia and the Pacific war theatres, although it's maximum effort was in the European theatre, where it caused many a Luftwaffe pilot's heart to beat faster than normal.

A total of 7600 *Mosquitos* were built by a number of factory units in England, to the design perfected by the De Havilland Aircraft Company.

In Australia, the De Havilland factory at Bankstown, New South Wales, produced 212 of the total for the Royal Australian Air Force squadrons in the Pacific war theatre. The majority of Australian production was known as the *Fighter Bomber Mk 40,* but a number of the Mk 40 were converted to Photo Reconnaissance Mk 41, and this forms the basis of the story. The Hawker De Havilland factory at Bankstown, in this year, 1986, some 40 years after its initial production, Mosquito A52 — 319, a Mk 41, is undergoing a complete restoration.

Mosquito A52 — 319 occupied a proud position outside Perth Airport for many years after the War. As the years passed, the extreme elements of the Australian sun and moisture caused considerable deterioration to the wooden air frame.

Vandals and collectors caused further loss and eventually A52 — 319 was towed behind the hangars to further neglect. An overseas buyer built a massive frame and planned to shift A52 — 319 to America. He succeeded in shifting it to Melbourne where, in 1979, the Canberra War Museum came to the rescue of this sorry aircraft and purchased it for restoration and inclusion in the Museum Aircraft Collection.

The De Havilland factory again played a vital part in the life story of A52 — 319 and today it nears completion under the hands of dedicated people.

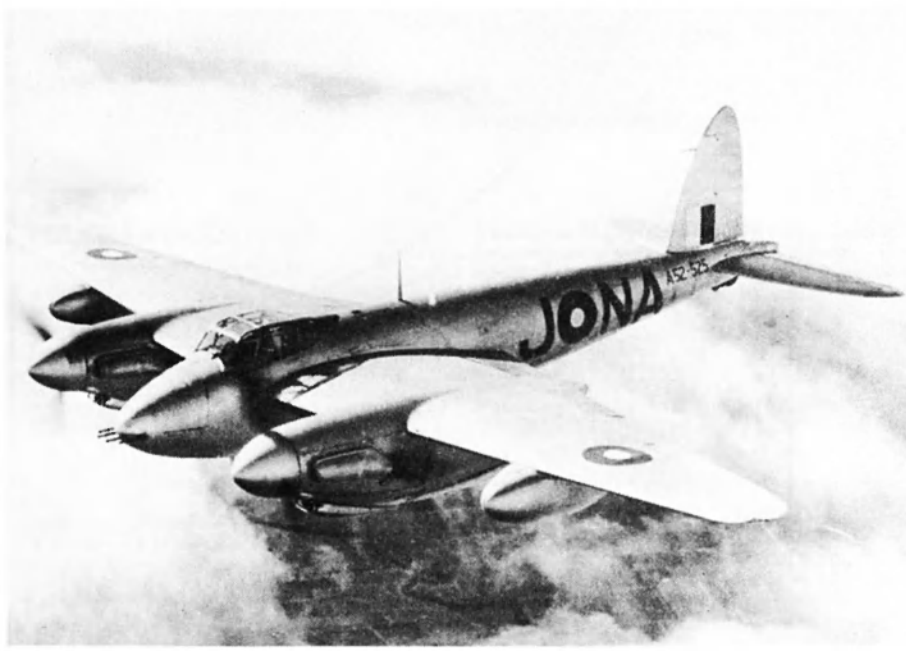
John Chadwicke of the factory is the restoration project officer, on behalf of the War Museum, and although he can manage the restoration of the air-frame and the engines, there is a complete lack of radio equipment. It is hoped that amateurs throughout Australia may be able to help with the construction of this famous war-bird.

Contributors will receive recognition of their efforts.

Parts required are:

Marconi T1154 transmitter; R1155 receiver and aerial coupling switch.
Cables and plugs for the T1154, R1155.
A left/right hand indicator for DF operation — this fits in the instrument panel.
The Loran APN9 navigation equipment.
The AC inverter 28 volt input 115VAC 400 Hz output — it has the voltage control on top. This is about 12 inches long by 12 inches high (about 30 cm).
Rebecca set SCR695 (3C966A).
A four-channel controller for the VHF transmitter/receiver SCR 522/TR 5043 with plugs and cables.
A restored SCR 522 and PE 94B rotary power supply has been obtained.
An Air Ministry brown Bakelite Morse key.
Two sets of Air Ministry headphones.
Any other instrument parts associated with the Mosquito.

For further information contact John Chadwicke at Hawker De Havilland Training School, 6 Ladbroke Street, Milperra, NSW. 2214, or phone Keith Muller, Department of Aviation Transmitters, Llandilo (02) 628 9777.



Mosquito A52 - 525 of No 1 Squadron, RAAF.

PRACTICAL EARTH RESISTANCE MEASUREMENTS

George Cranby VK3GI
PO Box 22, Woodend, Vic. 3442

A simple, but fairly accurate and widely accepted method of determining the resistance of an earth rod.

Having read with great interest the article *Aerials and Earths* by John Gazard VK5JG, in the May issue of *Amateur Radio,* I thought it may be useful to bring to readers notice a simple, but fairly accurate and widely accepted method of determining the resistance of an earth rod.

Place three similar earth rods, at least four to five metres apart, in the form of a triangle, and to an equal depth. Measure the resistance between each pair of rods.

The best equipment for this would be an *Earth Megger* or similar, but access to this type of equipment may be a bit difficult. The next best method is the application of a measured voltage between each pair of rods, measuring the current and calculating the resistance. If DC — say, from a car battery — is used, two readings must be taken by reversing the polarity, and the average of the two readings must be used.

Based on Figure 1, the following reasoning leads to the final formula:

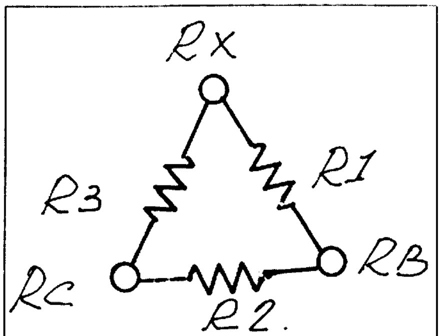


Figure 1.

$$R1 = RX + RB$$
$$R2 = RB + RC$$
$$R3 = RC + RX$$

$$RX = R1 - RB \text{ and } RX = R3 - RC$$

$$2RX = R1 - RB + R3 - RC$$
$$2RX = R1 + R3 - (RB + RC)$$

$$\text{As } R2 = RB + RC$$
$$\therefore 2RX = R1 + R3 - R2$$

$$RX = \frac{R1 + R3 - R2}{2}$$

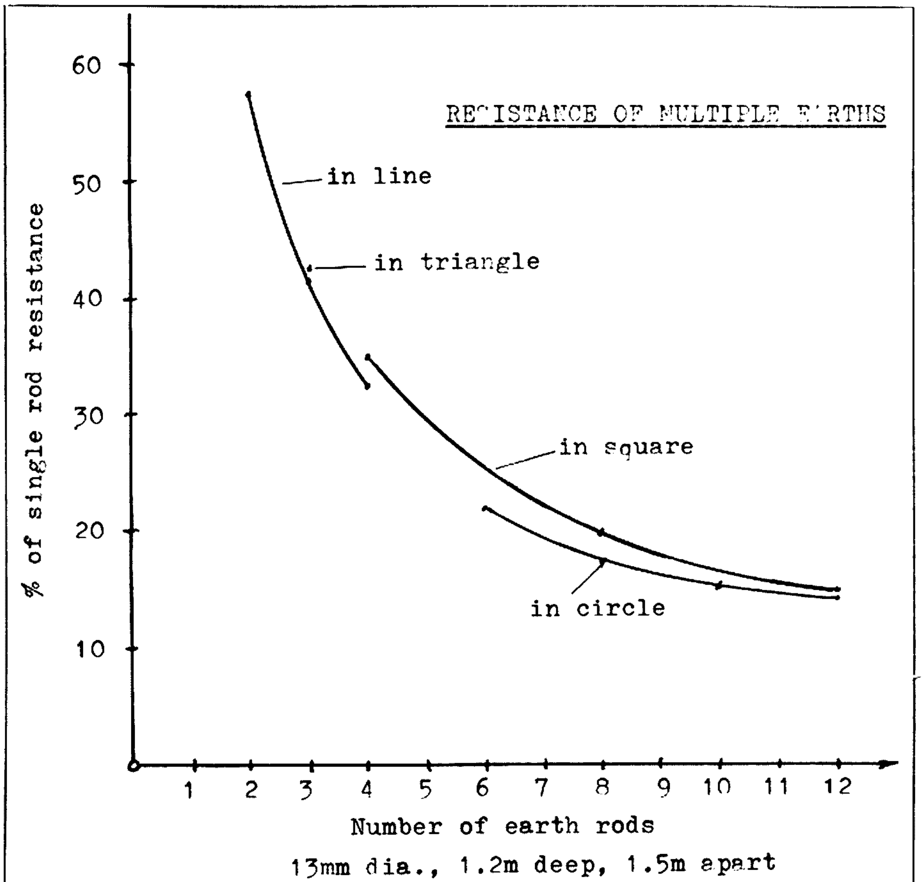
I have successfully used this method to measure ground conductivity of widely varying soils. In one extreme case (in far north Queensland), I found the resistance of an HV earth rod to be 3400 ohms. This effectively negated the protective ability of the HV fuse system. Even the resistance of an abandoned two inch (50mm) water bore pipe (sunk to 20 metres), gave a reading of 240 ohms! (Soils 'aint Soils, Sol . . .! Tech Ed). These field measurements were done with a car battery, voltmeter and ammeter.

Once the resistance of a single earth rod has been established, the graph in Graph 1 can be used to estimate the effect of multiple rod earths for a number of rod configurations. It can be seen that the total resistance does not diminish in the proportion of the number of rods, and that the reduction, in absolute terms, becomes almost insignificant for more than four rods.

Diameter and depth of the rods have some effect on the earth resistance, but their discussion is beyond the scope of this general note.

Further reading on the subject may be found in the excellent book *Earth Resistance* by G F Tagg, published by George Newnes Ltd, in 1964 and, in the fundamental study by H B Dwight *Calculation of Resistance to Ground* in the AIEE Transactions, December 1936.

ar



Graph 1.

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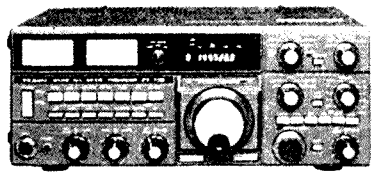
- FL-7000 1.8-30 MHz, 500W o/p s/s linear ..... coming.
- FC-757AT auto-tuner $479 $499



YAESU FT-726(R) . . . $1699
Includes 2m, mic, 2 x 208Y Yagis. Why pay $1749? SSB - CW - FM, 10W RF o/p, AC/DC (inc DC cable), 0.15μV on SSB, transceiver, inc mic. Optional 70cm $460 (inc 7018 GR*). 6m $360 (inc 606Y*), Sat $180. *When bought with FT-726(R). Full 12 months warranty on our Yaesu.

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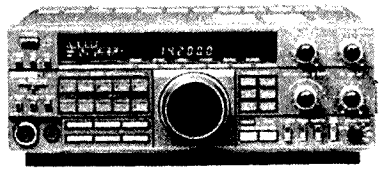

KENWOOD TS-440S . . . $1550
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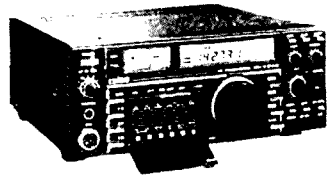

ICOM IC-731 . . . $1479
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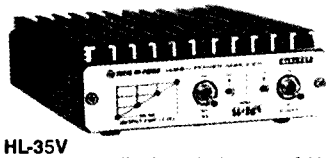
- HL-2K 2kW i/p, 160-10m, 2 x 3-500Zs $2150
- HC-200 ant tuner, 3 pos sw, SWR, pwr $249
- HRA-2 2m GaAsFET masthead preamp ... $269



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- *KR-600RC, 600kg/cm rotation torque $399
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AOR AR-2002 . . . $779
Professional scanning receiver covers 25-550 & 800-1300 MHz in two continuous tuning ranges. Sensitivity 0.3μV NFM. Manual tuning knob, S-meter, 20ch memory, AC pack inc.
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THE LAZY PI

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

The theory of this unit is that of the L network, but the series reactance is divided.

The centre fed aerial with tuned feeders is probably the best solution for amateurs requiring an all band HF aerial system, tailored to fit a suburban or country house block. The aerial and feeders of these systems can be any length to suit the block and building layout. The lack of resonant lengths is corrected with an Aerial Coupling Unit designed to match the 50 ohm unbalanced transmitter output to the balanced feeder input.

I have constructed an ACU which is simple and suits my situation; it could be useful for others with similar problems.

The theory of the unit is that of the L network (Figure 1), but the series reactance A is divided, half in each leg (Figure 2) and a balun is used to couple the network to the transmitter. The modified version needs a name — I suggest *Lazy Pi* (F).

The transmitter is coupled to the ACU by a 50 ohm to 50 ohm balun or a 50 ohm to 200 ohm balun via 50 ohm coaxial cable, any length. If the input to the ACU is through terminals a-a, it will match a resistance N times the output resistance of the balun (50N or 200N). If the ACU is reversed and the terminals b-b used as input, the unit will match resistance 50 divided by N or 200 divided by N.

The reactances must be opposite kinds; it is most convenient to make B a variable condenser and A a tapped inductor. To match resistance R_T greater than the balun resistance R_B, the reactance of A must be:

$$X_A = \pm R_B\sqrt{N-1}$$

and the reactance of B:

$$X_B = \pm R_B N/\sqrt{N-1}$$

where

$$N = R_T/R_B > 1$$

To match a resistance less than R_B, the reactance of A must be:

$$X_A = R_B\sqrt{N-1/N}$$

and the reactance of B:

$$X_B = \pm R_B/\sqrt{N-1}$$

where $N = R_B/R_T > 1$

Component B in my unit is a variable condenser, 30 pF to 240 pF supplemented with two fixed condensers, 150 pF and 400 pF switched in parallel as required. This provides three capacity ranges 30 to 240, 180 to 390, and 430 to 640 pF With this capacity range and 50 ohm input to a-a it is possible to match resistances from 70 ohms to 2000 ohms and with a 200 ohm input to b-b matching loads as low as 5 ohms is possible.

There are complications:

a *The feeder input impedance will be complex and the reactive component must be included in A when R_B is larger than R_T and in B when R_B is less than R_T.*

b *The Q of the circuit is low {$Q=(N-1)^{1/2}$} and therefore it is not very effective at suppressing out of band emissions.*

c *Suitable switches for the switched tap inductance my be difficult to find. Mine is from a WWII transmitter.*

Trial and error adjustments of L and C in the *Lazy Pi* aided by the choice of two transmitter output impedances will get results in most cases. If it is difficult to get a good match on some bands it may be necessary to sacrifice some environmental considerations and alter aerial and/or feeder lengths to achieve manageable impedance on all bands. The 'named varieties' of the centre fed tuned feeder systems do this but unfortunately their solutions apply to a limited number of situations.

A home station all HF band aerial system ideally, should be a planned design integrating all elements into the environment. To do this properly, calculations of feed point impedance for various physical arrangements should be the starting point; this is a very tedious task, hopefully a WIA member will devise a simple method for inclusion in a future paper. For those interested I recommend a paper by Brian Austin ZS6BKW, in *Radio Communications, August 1985.*

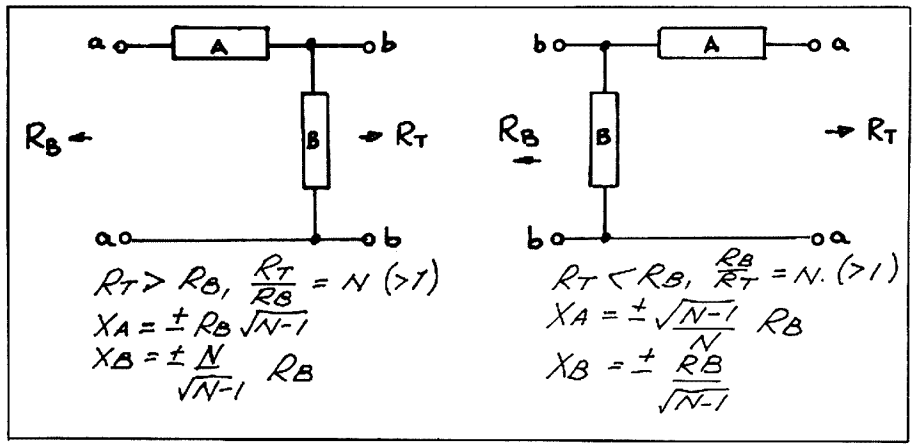


Figure 1 — Basic L Network.

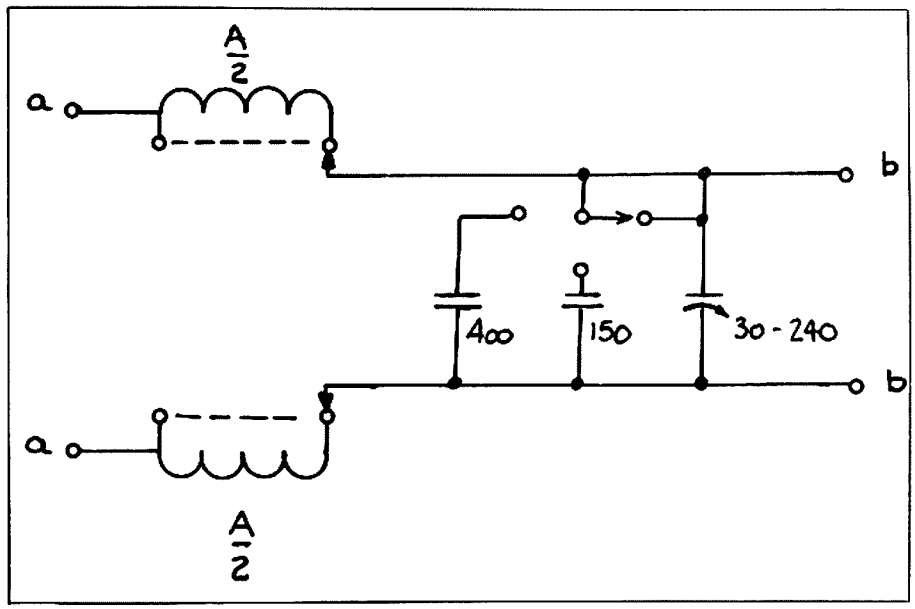


Figure 2 — Balanced L.

QSP

NO OBJECTIONS

The Department of Communication has recently received a number of inquiries as to whether, under the Radiocommunications Act 1983, a non-amateur while studying for their amateur qualification can possess an amateur transceiver for use of the receiver section only.

It is advised, for the interest of all WIA members, that as it is the persons ultimate intention to make transmissions technically they could be considered to be in possession for the purposes of operation. This is an offence under Section 23 of the Act. The Department, however, recognises the practicalities of the situation. Consequently, there are no objections to such operations providing that the transmitter section of the transceiver is disabled in a manner which is not quickly restored (ie removal of the output valves, etc).

Before Valve Amplification — Wireless Communication of an Early Era

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

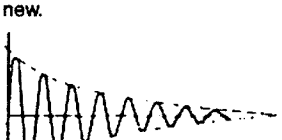
At the turn of the century there were no amplifier valves and no transistors, but radio communication across the ocean had been established. Now we look back and see how it was done and discuss the equipment used.

In the complex electronics world of today, where thousands of transistors junctions are placed on a single silicon chip, we regard even electron tube amplification as being from a bygone era. We tend to associate the early development of radio around the electron tube as an amplifier, but we should not forget that the pioneers had established radio communications before that device had been discovered. This article examines some of the equipment used for radio (or should we say wireless) communications of that day.

Discussion will concentrate on the equipment used and associated circuit descriptions rather than the history of its development. Anyone interested in history is referred to a thesis *The Historical Development of Radio Communications* by J R Cox VK6NJ, published as a series in Amateur Radio, from December 1964 to June 1965.

Over the years, some of the early terms used have given-way to other commonly used ones. Radio was called wireless, and still is to some extent. For example, it is still found in the name of our own representative body, the WIA. Electro Magnetic (EM) Waves were called hertzion waves or ether waves and the medium which supported them was known as the ether. A tuning coil was called a jigger and a capacitor was a condenser. A wireless operator was known as a Sparks and we now seem to have graduated from cycles-per-second to Hertz.

Some of the explanations given in the text are modified extracts from references used and some licence is taken in using terms, both old and new.



A Damped Oscillation in a Single Circuit.

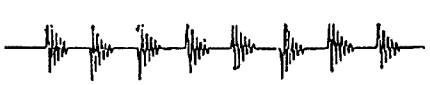


Figure 1 — Oscillogram of Damped Electric Spark Waves.

DAMPED WAVE TRAINS

Signals generated for transmission of wireless telegraphy, in the early years, were in the form of Damped Wave Trains, as illustrated in Figure 1. A tuned circuit, coupled to the aerial was shock excited into oscillation by rapidly discharging a capacitor, part of the tuned circuit, at repetitive intervals, usually corresponding to a repetition rate equal in frequency to a sound in the human hearing range. For each discharge, a wave train was generated, decaying in amplitude as each resonant cycle transferred energy to the aerial. The resonant frequency of the tuned circuit, partly formed by the aerial, set the frequency of transmission.

On reception, the detected output either actuated a telegraph recording device or was coupled to a telephone receiver to generate an audible buzz at a frequency related to the wave train repetition rate.

The reason for generating damped waves can be appreciated when thought is given to what is needed to generate continuous waves. To generate these, the energy lost in the tuned circuit must be continuously replaced at each cycle, these days achieved by feedback through an amplifier, the device the pioneers did not have until DeForrest developed the triode valve. Notwithstanding this, the pioneers did find ways of generating continuous waves, without valves, as we shall see later.

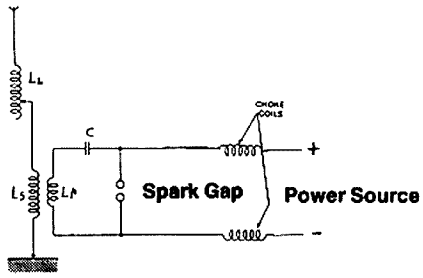


Figure 2 — Basic Spark Transmitter.

Returning to our damped waves, the basic circuit for generating these is the spark transmitter, see Figure 2. Capacitor C is charged from the power source until it develops a voltage sufficient to break-down the spark gap. At this point in time, capacitor C is connected, via the spark gap, across primary inductance Lp and its energy is released to the tuned circuits made up of C, Lp, Ls and the aerial reactive components. The dampened wave train is commenced as energy, is continuously lost in radiation via the aerial. The wave train repetition rate is controlled by the time constant of the charge circuit, largely the capacitance of C and the impedance of the choke coils and power source.

QUENCHED SPARKS

In the design of spark transmitters, a great deal of attention was given to quenching of the spark, that is the spark had to be quickly extinguished once the tuning system had been set-up in oscillation. The reason for this can be explained by considering the theory of mutually coupled tuned circuits. If two circuits, tuned on the same frequency, are coupled together and set in oscillations, energy is transferred from one to the other to an extent determined by the coefficient of coupling (K). If K is low, coupled energy is small and one resonance occurs at a common resonant frequency. If the coefficient of coupling is increased beyond a value, called critical coupling, two resonant peaks occur (refer Figure 3).

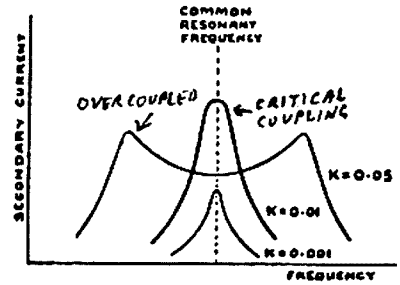


Figure 3.

Referring again to the spark transmitter circuit of Figure 2, there are two tuned circuits mutually coupled, one formed by the transformer primary Lp and its resonating capacitor C and the other formed by secondary Ls and the aerial circuit reactance. Tight coupling beyond critical value is necessary to ensure maximum transfer of energy from primary to secondary and hence there are two resonant frequencies which can be transmitted.

Returning to the discussion as the spark quench, this in effect disconnected the primary tuning capacitor from the transformer primary intermediately following the spark discharge, so that resonance occurred singly in the aerial resonant circuit to prevent transmission of a second frequency.

A further function of the spark quench was to improve the efficiency of the circuit. If the spark has been allowed to be sustained during the whole oscillation train, additional power would have been lost in the primary circuit through the spark gap.

SPARK TRANSMITTERS

High power spark transmitters were used for many years in wireless stations on shore and on ships. Some transmitters were still in use as emergency equipment on-board ships in the years well after World War II.

There were a number of variations in spark transmitter designs on the method of charging the capacitance from the power source, the type of power source and the method of quenching the spark gap. We shall discuss a number of these.

THE INDUCTION COIL

The induction coil was used as the power source for low power spark stations operating from dry cells or accumulators. It provided a means to generate the high voltage necessary to energise the spark gap from the low voltage battery source. A circuit diagram is illustrated in Figure 4.

An induction coil consists of a primary coil of thick wire wound with a number of turns on an iron core composed of a bundle of soft iron wires. The secondary consisted of many turns of fine wire so that a very high voltage step-up was achieved. In series with the primary winding was the *interrupter* consisting of a soft iron armature, secured to the top end of a flat

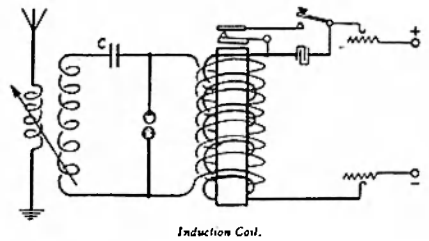
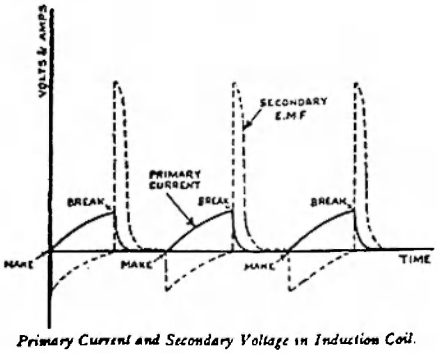


Figure 4[6].

steel spring whose tension could be adjusted by means of an adjusting screw. Action is as follows.

When the key is pressed, a current flows through the interrupter contacts and the primary winding. The core is magnetised and the armature is attracted to it. The contacts are therefore suddenly separated and the current through the primary rapidly falls to zero. As soon as the primary current has died away, the armature is released and contacts are again made, re-organising the primary to repeat the cycle of events. The cyclic time constant sets the spark train repetition rate.

Across the contacts, a time capacitor controls the rise and fall of current to reduce arcing across the contacts and improve circuit operation.



Primary Current and Secondary Voltage in Induction Coil.

Figure 5[6].

At contact break, a high voltage is developed in the secondary coil as shown in Figure 5, and this is used to charge capacitor C for the initiation of each spark discharge and start of a wave train.

ALTERNATOR AND TRANSFORMER SYSTEM

The most universal practice for energising spark oscillating circuits of half-kilowatt spark transmitters and larger units, was to use an alternator or rotary converter with its AC output voltage stepped-up via a transformer to a value sufficient to break down the spark gap.

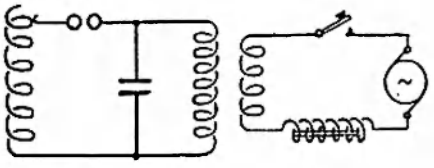


Figure 6 — The Alternator and Transformer Method[6].

A typical energising circuit is shown in Figure 6. The inductance in series with the alternator controls the power taken from the alternator and together with the tuning inductance, limits the charge rate of the capacitor.

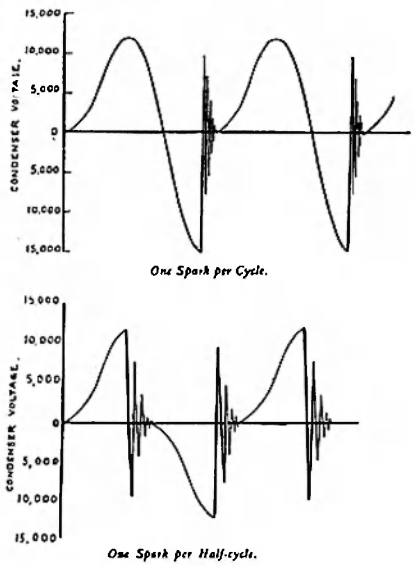


Figure 7 — Spark Train Frequency[6].

Depending on the adjustment of the spark gap relative to the AC voltage applied, either one spark per half AC cycle or one spark per one AC cycle, takes place. This is illustrated in Figure 7. The spark train repetition frequency is therefore either twice the alternator frequency or equal to the alternator frequency.

A number of methods have been used to quench the spark. On some transmitters, a special quench gap was used which rapidly cooled the spark. The spark gap was broken up into a number of very short gaps in series and used electrodes made of metals which were good heat conductors, coupled to radiating fins to dissipate the heat to the surrounding air. Forced air cooling was also sometimes used.

Another method was to use a rotating spark gap consisting of a metal wheel carrying a number of studs or spokes projecting from its edge and which rotated between two fixed spark electrodes so that the spark duration was controlled.

Rotating spark gaps were classified as either synchronous or asynchronous types. The synchronous type was coupled to the shaft of the alternator which supplied power to the oscillating circuit so that the spark was synchronous to the alternator frequency and phased to coincide with maximum voltage across the charging capacitor in the tuned circuit.

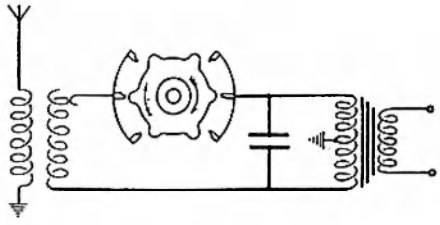


Figure 8 — Asynchronous Rotary Gap[6].

In the asynchronous type, as shown in Figure 8, the speed of rotation of the gap was independent of the speed of the alternator. In this system, some sparks were missed when timed at the low voltage phase of the alternator cycle, refer to Figure 9. The advantage of this system, however, was that the alternator could be run at a lower frequency than the wave train

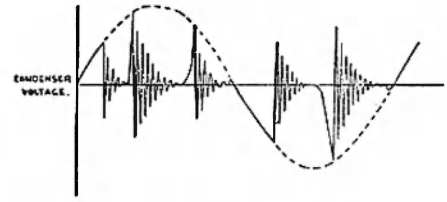


Figure 9 — Condenser Voltage with Asynchronous Rotary Gap[6].

repetition frequency, the latter being controlled by the rotating gap rather than the alternator speed.

In transmitters which employed no special spark quench circuit, it was necessary to reduce coupling and detune the aerial circuit to prevent transmission of two frequencies. This was done at the expense of reduced power output coupled to the aerial.

Examples of quench gap (QG) transmitters are shown in Figures 10, 11 and 12.

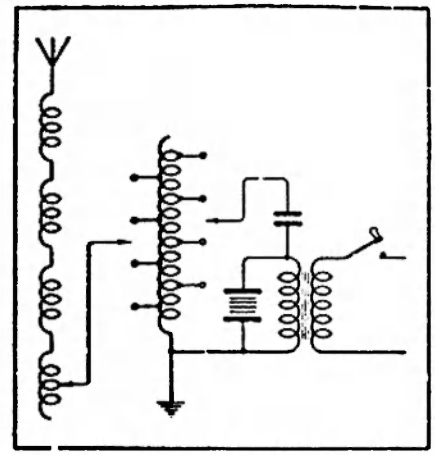


Figure 10 — Siemens ¼kW QG Transmitter[5].

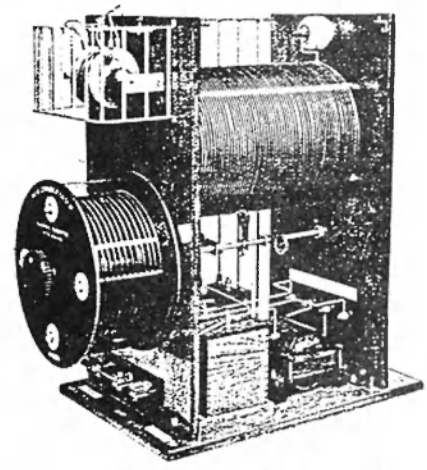


Figure 11 — Radio Communication Co, Type T24, ¼kW QG Transmitter[5].

WIRELESS TELEGRAPHY RECEIVERS

This segment will examine some of the devices used to detect the transmitted signals. There were no amplifying devices as they are known today, and the signal level fed to the detector was that received from the aerial system. The detector was connected via a single tuned circuit and hence selectivity to reject unwanted signals, close in frequency to that being used, was low.

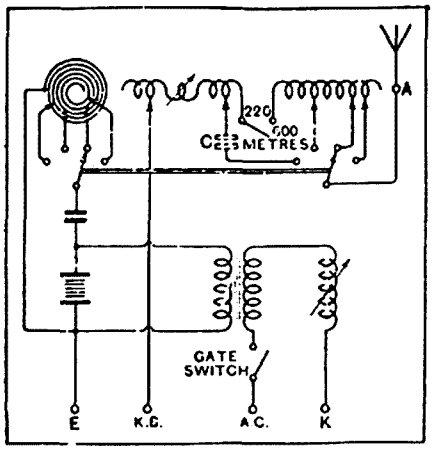


Figure 12 — Wiring Diagram of 369 QG Transmitter[8].

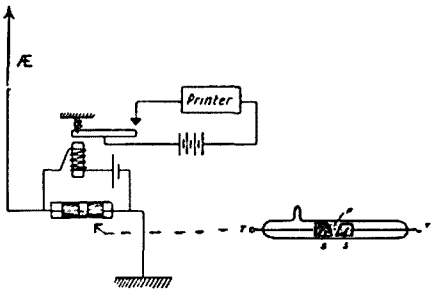


Figure 13 — Filings Coherer and Receiving Apparatus[1].

FILINGS COHERER

The earliest form of detector to give good results was the filings coherer, so named because of the discovery that in the presence of a high frequency alternating current, metallic filings tend to cling together or cohere.

The coherer is illustrated in Figure 13. The small glass tube is exhausted of air. The terminals TT are connected to silver plugs SS, which are separated by the nickel and silver filings. A DC circuit connects the coherer to a relay which controls a Morse inker or relay. The *coherer* is also connected via the tuning system to the aerial. With no signal input from the aerial, the filings have low conductivity, but when a signal from the aerial flows through the coherer, the filings cohere and increase conductivity so that the relay is energised.

A problem with the coherer was that after each wave train had passed through it, the device had to be *de-cohered* by means of a tapper to shake-up the filings to restore low conductivity. The apparatus to do this is not shown in the diagram. A further problem was that the coherer was easily upset by atmospheric static.

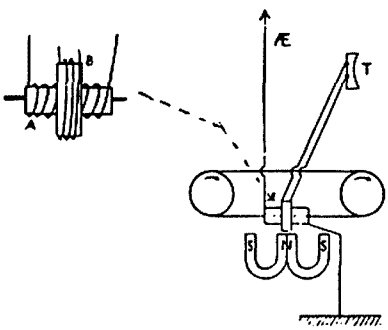


Figure 14 — Magnetic Detector[1].

THE MAGNETIC DETECTOR

Marconi is accredited with having made a great advance in detection with his invention of the magnetic detector, refer Figure 14. Two mutually coupled coils are located in the static magnetic field of a permanent magnet. One coil (A) is connected via the tuning system to the aerial and the other coil (B) is connected to the telephone receiver. The magnetic field is concentrated by an endless band of iron wire which passes through the coils and during operation, rotates continuously through them.

Operation is as follows.

When a magnetic field is removed from soft iron, there is a lag in the collapse of the field or what is generally called hysteresis. Because of this effect, the magnetic field in the wire is dragged along, past the normal field of the magnet, by the movement of the wire.

When a signal is received, a high frequency alternating magnetic field is developed from signal current in coil A. This reduces the hysteresis effect and hence increases the strength of the field from the magnet passing through coil B. A change in field strength through coil B develops a voltage at B so that each time a wave train is received, the telephone receiver is actuated, generating sound.

The maggie *as this detector was called, was a decided improvement over the filings coherer and was used as standard Marconi equipment for many years. Though not more sensitive than the coherer, it was rugged, reliable and much faster in operation.*

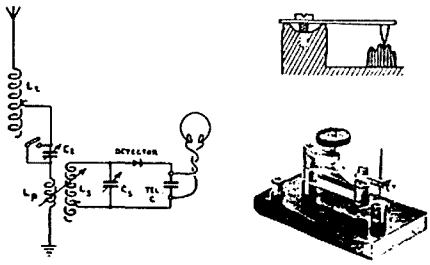


Figure 15 — Crystal Detector.

THE CRYSTAL DETECTOR

A further development was the mineral or crystal detector consisting of a piece of crystalline carborundum or crystal-line silicon with a metal point contact as shown in Figure 15. This device conducted current more readily in one direction than the other and was the forerunner of the modern point contact semiconductor diode, the operation of which is now explained by solid state theory.

Every amateur radio enthusiast knows how a crystal radio receiver operates. Rectification by the crystal detector produces an RF component superimposed on a DC component. When the amplitude of the RF signal varies with modulation or the spark wave train, the DC component changes with it. A low pass filter formed by the headphone impedance and a by-pass capacitor removes the RF component leaving the demodulated signal which drives the headphones.

Another way to explain the process is to consider the RF signal as a carrier plus sideband components. If these are fed through a non-linear device, such as our detector, different components between the carrier and the sidebands are produced which are separated from the RF frequencies by the low pass filter. These demodulated components are, of course, audio frequencies related to our spark train repetition frequency or speech in the case of a radio telephony signal.

Another device used by the pioneers was the electrolytic detector. This also operated in a non-linear mode in that its resistance varied as a function of the signal current fed through it. This device will be considered further when reception of radio telephony is discussed.

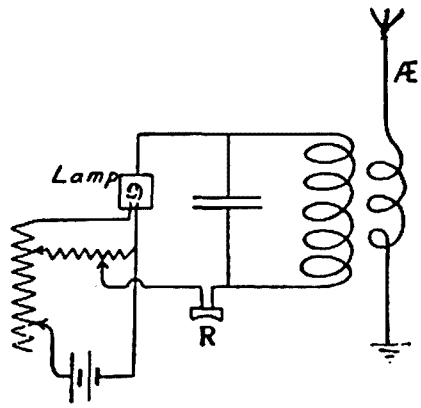


Figure 16 — Fleming Valve Detector.

The last receiver circuit for the present, shown in Figure 16, uses the Fleming valve detector, or as we know it, our diode valve detector. It was Edison who first discovered that if a heated element and a metal plate were both placed in an evacuated envelope, current would flow in one direction, but not in the other. The diode valve was first used by Fleming for rectification in the detection process and it remained as a widely used detector in TRF and super-heterodyne receivers of a later era, until semi-conductor devices replaced valves as amplifiers and rectifiers.

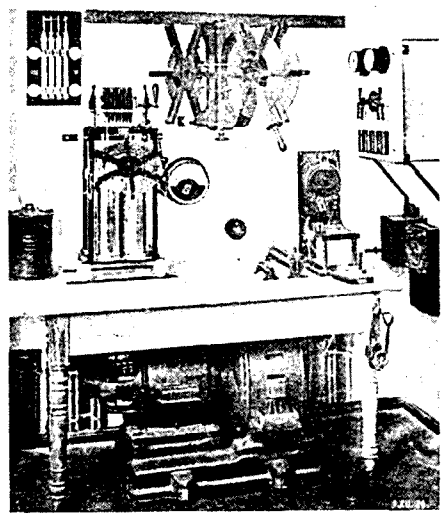


Figure 17 — Standard Ship Set, Antenna Energy 1.5kW. Telefunken System[1].

WIRELESS INSTALLATIONS

This section will examine some early wireless station installations shown in Figures 17-23. A typical early ship installation is shown in Figure 17. In general, ships operated on frequencies below one megahertz in what is known today as the medium frequency (MF) band. For long distance communication frequencies as low as 30kHz (approximately 9000 metres), were used in the now low frequency (LF) band. Figure 23

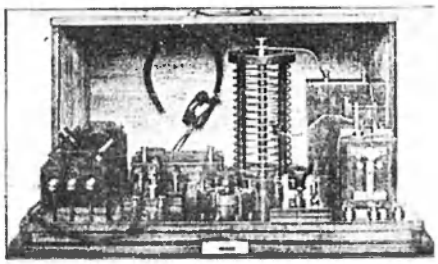


Figure 18 — Very Small Portable Wireless Station[1].

Figure 19 — Interior of Station at Suva, Fiji Islands[1].

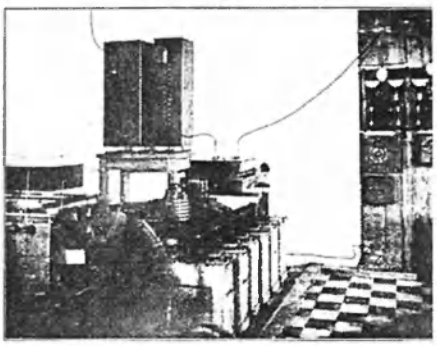


Figure 20 — The Rotary Spark Gap, Oscillating Transformer, and Inductances, Athens Station[1].

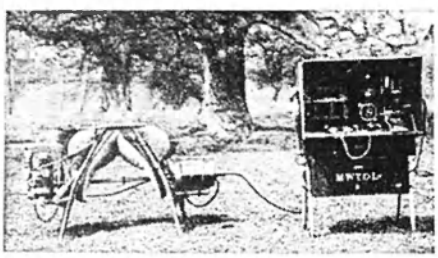


Figure 21 — A Portable Field Station for Cavalry[2].

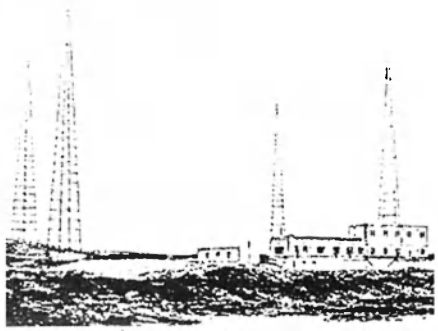


Figure 22 — The Las Palmas Station[2].

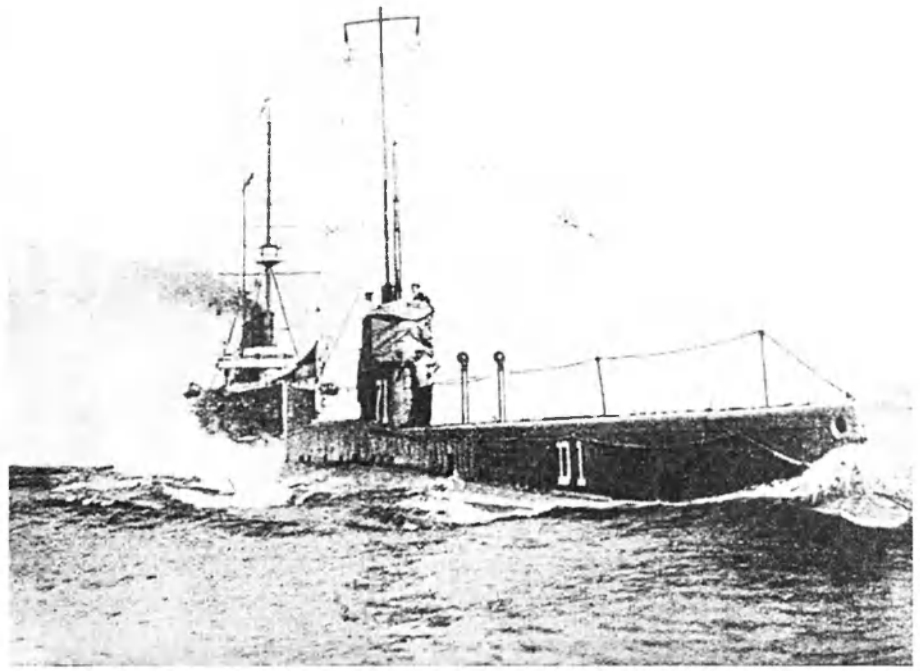


Figure 23 — Wireless Aerial on a Submarine and HMS DRAKE[2].

illustrates the massive aerial systems needed to operate at these long wave- lengths.

Figure 18 shows a low power portable wireless station using an induction coil as the spark transmission source. Figure 20 is an interesting photograph of a portable field station for cavalry. It has a dynamo driven by a petrol engine mounted on a saddle.

An early submarine filled with a large aerial structure is shown in Figure 23. According to the source from which this was obtained, the structure had to be collapsed when the submarine was submerged.

CONTINUOUS WAVES

Methods for generation of continuous waves were first discovered by Professor Elihu Thompson and ultimately developed for wireless telephone purposes by Professor R A Fessenden using a high frequency alternator coupled directly to the aerial system. Development of special alternators was carried out by a Swedish engineer E F W Alexanderson.

The original alternator supplied power of about one kilowatt at a frequency of 80kHz. Around the period of World War I, alternator transmitters had been built and put into commercial operation with power as high as 200kW. This was high power by any standards.

The discovery of the *singing arc* by Duddell in 1900, opened up a new and promising field for continuous waves transmission, especially for telephonic purposes. He found that under certain circumstances, the electric arc could be set in a state of continuous high frequency oscillation, the frequency depending on the proportion of inductance and capacity inserted in a branch or short circuit of the arc, refer Figure 25. Burning in air, the frequency was limited to about 40kHz maximum and the system was further developed by Poulson who discovered that the frequency could be raised by forming the arc in hydrogen or hydrocarbon gases under high pressure. Cooling one of the arc poles with water to keep it cool was also found to be important.

The gases were used because of their high heat conducting power and to make the cooling effect still greater, the arc was formed between the poles of a strong electro-magnet. By repulsion of the electrofied gas, the magnetic field caused rapid circulation of the gas around the electrodes. Using the Poulson system, frequencies as high as one megahertz were achieved compared to 100kHz for the alternator system.

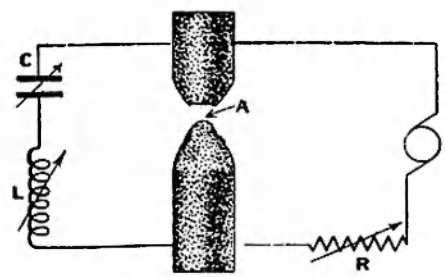


Figure 25 — Arrangement of Duddell ARC. There are really two circuits in this arrangement, one carrying oscillating, the other direct current. Direct and alternating current are carried at the same time by the arc and the carbons, and all the constants in the circuit being correct the arc A will give a musical note[3].

Again referring to Figure 25, the action of the singing arc is explained by Dr J A Fleming, as follows.

If a condenser in-series with an inductance of low resistance is placed as a shunt across the arc, the first effect is to rob the arc of some current to charge the condenser. This action, however, does not decrease, but increases slightly the potential difference of the carbons. Hence the condenser continues to be charged. When the charge is complete, the current through the arc is again stationary and the condenser at once begins to discharge back through the arc. This however increases the current and decreases the potential of the carbons, hence the action proceeds until the condenser is discharged.

In the circuit these are really two circuit paths, one carrying an oscillating current and

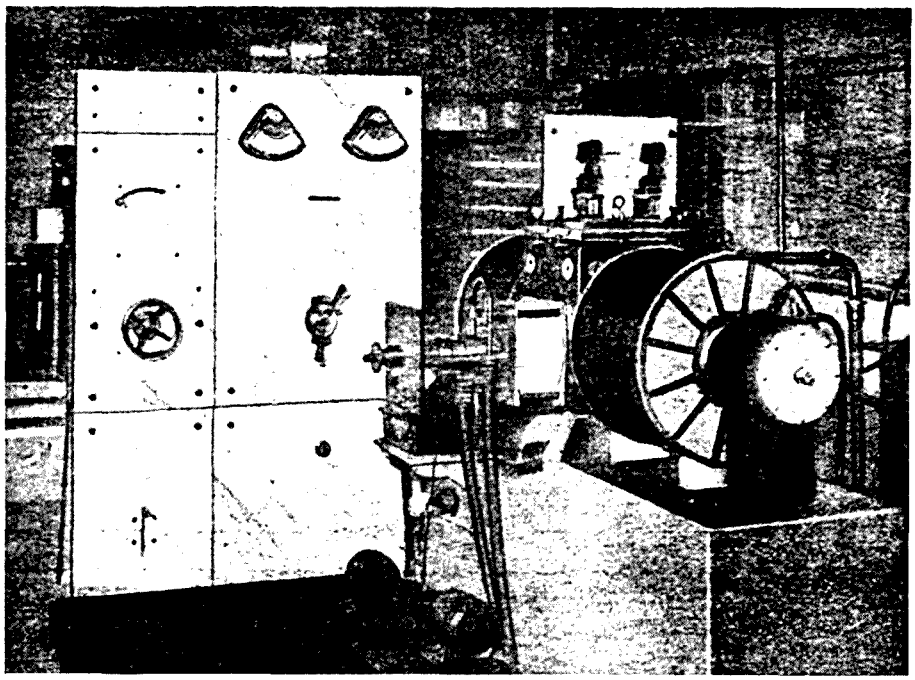


Figure 26 — The Eiffel Tower Arc Transmitting Station. On the right is the Poulsen 60kW arc transmitter. The powerful electro-magnats are used for steadying the arc. To the left of the machine is the control panel. The electrodes of the arcs consist of a carbon cathode and copper anode. The electrodes are in a water-cooled chamber[5].

the other a direct current. The former is the circuit CLA, whilst the latter is the circuit of the generator and RA. The arc A thus carries both direct current and high frequency alternating current at the same time.

The actions of the singing arc are also explained by Duddell to be dependent upon the fact that the arc itself must be regarded as having a negative resistance. That is to say, that at any moment, the instantaneous change in volts divided by the corresponding instantaneous change in amperes in the circuit ACL, must be a greater value than the resistance of the circuit and negative in sign, so that in each cycle the current builds up whilst the voltage decreases. These same conditions are, of course, necessary to maintain continuous oscillation in any oscillating circuit, be it valve, transistor or whatever.

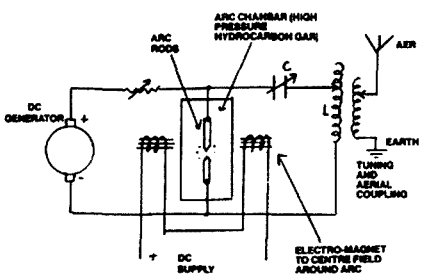


Figure 27 — Poulsen-type Arc Transmitter[5].

The circuit of a Poulsen arc transmitter is shown in Figure 27, and a typical installation in the Eiffel Tower in Paris is shown in Figure 26.

WIRELESS TELEPHONY

The wireless telephone transmitter used by Professor Fessenden is illustrated in Figure 28.

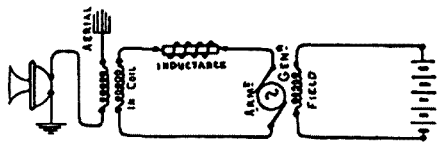


Figure 28 — Transmitting Station, Fessenden's Wireless Telephony[4].

The carrier frequency is generated from a high frequency alternator and amplitude modulation of the continuous waves is achieved by passing the aerial current through a solid back carbon granule telephone transmitter so constructed that it could carry a very heavy current without overheating. Sound at the telephone-transmitter diaphragm varied the resistance of the granules and hence the loss resistance in the aerial circuit.

In one form, the heat generated was dissipated by constructing the carbon chamber with two deep grooves so as to obtain a large air cooling surface. In a later and more satisfactory form, called the *trough* transmitter, the same objective was achieved by circulating water through a water jacket surrounding the carbon chamber. This form, shown in Figure 29, could carry as much as 15 amps of RF current continuously.

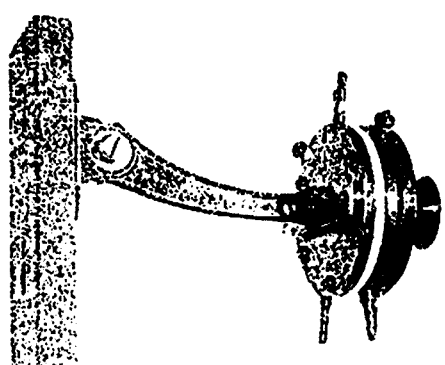


Figure 29 — Fessenden's Trough Carbon Transmitter[4].

Another form of transmitter used with considerable success was the *majorana* hydraulic transmitter. The operation of this was based on the capillary properties of jets of liquid and the device was made up of a small glass tube from which spurted a jet of acidulated water under steady pressure. The glass tube was connected to the diaphragm of the transmitter with an elastic envelope and the jet of water fell between two platinum plates. With a steady jet, there was constant resistance between the plates, but if the diaphragm was made to oscillate from a sound source, the resistance between the plates, controlled by the jet, was varied.

Other wireless telephoning systems have made use of the *singing arc*. Professor Ruhmer used a series connection of 12 arcs, each having a carbon and copper pole, the latter being kept cool by circulation of water inside. The arcs in this case were not enclosed; or under pressure. The arcs were operated at a current of four amps, at a voltage of 440 volts and the operating frequency was 400 kHz. Figure 30 shows the transmitter system used. The 12 series arcs are shown as one in the diagram. Amplitude modulation is achieved by coupling the output of a carbon granule telephone transmitter into the arc circuit via a transformer in order to modulate the current through the arc.

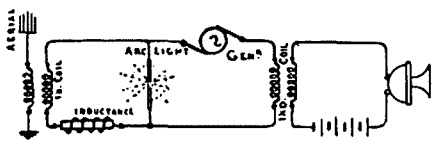


Figure 30 — Singing Arc Method of Transmission[4].

It is difficult to understand how the low power output of a carbon transmitter or microphone could effectively modulate the high power of the arc, but it is claimed in reference four that comparatively small variations at the microphone cause very large fluctuations in the operation of the arcs. A later system used by Poulsen had 12 solid back carbon granule transmitters with electrical outputs connected in parallel and all fed from the one common voice mouth-piece.

Another modulation system for alternator-type transmitters is briefly described in reference four. Effective amplification of the modulating signal is achieved by modulating the DC field current to the alternator which *in* turn, controls the AC output voltage.

Until the time when valve amplification methods became available, the power output of radio telephone transmitters was limited by the current control capability of the microphone transmitting devices. A single solid back carbon granule transmitter developed by Fessenden could vary the through current about half an ampere. The multiple parallel system used by Poulsen could vary it about 10-12 amperes. Where the device was used to modulate the field of a high frequency alternator, output powers from the alternator up to 10kW were achieved. Just how well the carrier was modulated by these systems is not clear from the references.

WIRELESS TELEPHONY RECEIVERS

Professor Fessenden is accredited with a great deal of the development of early wireless telephony systems and in his experiments, he made use of a number of different detection systems. One detector utilised the liquid or electrolytic barretter shown in Figure 31. This device consists of a small cylinder containing conductive liquid, such as nitric acid. A metal

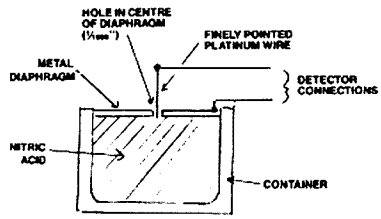


Figure 31 — Fessenden's Electrolytic Detector[6].

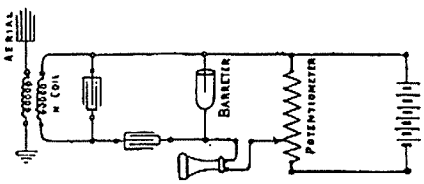


Figure 32 — Barretter Receiving Circuit, Fessenden's System[4].

diaphragm, with a small hole in the centre is immersed in the liquid, together with a finely pointed platinum wire in the centre of the hole. The diaphragm and the fine wire are connected in the detector circuit forming the non-linear element for detection, refer Figure 32. Operation is such that the layer of liquid between the fine point and the rim of the hole forms a resistance element which varies in proportion to the intensity of the signal.

The barretter is biased with a DC current from the battery which, it is assumed, allows the barretter to be set for maximum slope in the resistance versus current characteristic. According to one reference, the detector could respond to signals of 150 micro-volts.

Fessenden also made use of a thermal barretter. This was made up like an electric lamp with a very short length of platinum wire drawn to a diameter of 0.06 mil. Several of these were used in series as the non-linear element in the detection system and utilising the principle that the resistance of the wire varied as a function of its temperature, which varied with the strength of the signal voltage across the wire.

Fessenden was able to further improve detection sensitivity by the use of his *heterodyne* receiver. Heterodyning means combining two frequencies to produce a third. For example, if two frequencies of 100kHz and 98kHz are heterodyned, sum and difference frequencies are produced. If the higher frequencies are filtered out, the difference frequency of 2kHz remains.

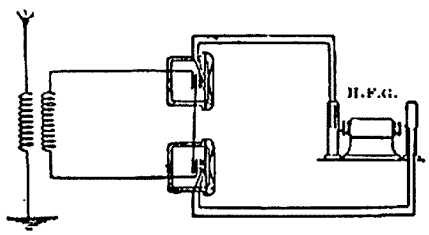


Figure 33 — Fessenden's Heterodyne Receiver[4].

Figure 33 shows the detector Fessenden used. The two telephone receivers, or headphones each have two coils around a soft iron core. One coil is coupled to the mica diaphragm and the other is fixed. One coil is connected to the received signal source from the aerial and the other is connected to one of the outputs of the high frequency generator (HFG), set to the same frequency as the incoming carrier.

Operation of the heterodyne receiver appears to be as follows:

With no modulation, the diaphragm, due to its inertia, does not follow the high frequency signal and, in any case, the signal could not be heard by the human ear. With modulation, sideband component frequencies are received and the summed magnetic field causing attraction and repulsion between the two coils and moving the diaphragm, contains a component which the diaphragm can follow equal in frequency to the difference frequency of the sidebands and the high frequency generator. This difference component is of course our demodulated speech or telephone signal.

Other detectors used for wireless telephony were the crystal detector and the Fleming valve detector, both previously described.

Whilst commercial wireless telegraphy became well established without the amplifier valve, early wireless telephony appeared to be mainly experimental until the introduction of the amplifier valve allowed further development of commercial voice communication and radio broadcasting.

FINALE

The era of wireless communications discussed here is barely a lifespan past. The electronics world without computers, integrated circuits, transistors and valves has been covered. At that time, the potential use of the ionosphere and the higher frequencies had still to be discovered. Old-hat technology perhaps, but the foundation of an almost explosive advance in electronic technology which has now dominated our lives in almost any place we work and in our homes.

The older we get, the more we seem to enjoy researching the past. Preparation of this material has been an interesting exercise, perhaps you have found it interesting too!

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AR

WONDERS OF MORSE

In recent Pat Hawker G3VA columns, attention has been drawn to the remarkable and unique value of Morse code in enabling badly handicapped people to communicate *in equal terms* with those more fortunate than themselves. The degree to which this is truly the case is well illustrated in correspondence from Bob Smith G6TQ and B J Frost G6UTN.

G6TQ describes a project in which he, RAIBC and the West Kent ARS have been involved in for the past two years, and which has been described in a new book *Computer Help for Disabled People.*

This project centred on a young man, Mark Brown, 22-years-old, confined to a wheelchair, blind, profoundly deaf and, due to his deafness from birth, with a severe speech impairment. Yet Mark has achieved an ability to copy Morse.

G6TQ says: "We talk to him at 25 to 30 WPM, but he can read at virtually any speed. He is unable to write and just reads it in his head like a book. This is achieved by a wheelchair-borne micro-computer which is programmed to translate plain language typed on the keyboard into fast Morse. This he reads through earphones by bone conductivity, as he can sense the vibrations."

As a result of Mark's new interests, he has put weight on his frail body, and has become more alert and lively. Via his keyboard he can talk to anybody.

G6UTN reports similarly on successful work with the deaf. His project commenced when he developed an aid for the family of a totally deaf girl to enable them to call her from within the confines of a house and garden. This aid comprised a low-power receiver used in conjunction with an indication device mounted on the girls spectacles. Her mother was then able to call her from a simple base transmitter using either simple pre-arranged codes or their pre-existing knowledge of Morse Code.

Work then continued with a two-way aid intended for a similar application or for use by two totally deaf persons and consists of identical transceiver-type units in conjunction with a wristwatch-mounted indicator and push-button. When one person wishes to call the other, a single press of the button causes a motorised vibrating device to be activated. Two-way communication can then continue using the indicators and buttons based on either pre-arranged or Morse codes.

Condensed from *Radio Communication*, May 1986

RESIN MOULDED TRIM POTS

The miniature VTL type resin-moulded trimming potentiometers offer an alternative to cermet film trim-pots.

Because of the moulded construction, they offer good resistance to solder heat and flux interaction.

Resistance values range from 200 ohms to 1M ohm and pin spacing is based on the industry standard 5 mm grid.

Adapted from *Electronic News*, p31 — April 1986

Cartoon courtesy *The Propagator*

QSP

DOC STATISTICS as at March 1986

STATION/SERVICE	ACT	NSW	VIC	QLD	SA/NT	WA	TAS	TOTAL
AMATEUR LICENCE TOTALS	304	4848	4557	2601	1962	1439	589	16300
— Beacon	2	22	12	23	6	23	2	90
— Limited	55	847	1020	352	294	216	107	2891
— Limited/Novice	17	325	310	225	149	90	39	1155
— Novice	51	914	775	612	385	216	96	3049
— Unrestricted	179	2740	2440	1389	1128	894	345	9115
WIA Members	228	2237	2300	1282	1025	724	316	8112
Percentage	75	46	50	49	52	50	53.5	49.76
CBRS								
— 27 MHz	365	28903	29045	26187	13315	10242	3651	111708
— UHF	113	13168	12911	15378	13624	6799	2098	64091
Repeaters								
— Amateur	2	42	49	29	14	13	11	160
— CBRS	-	27	17	34	15	14	8	115

This is a program for a station log for the Commodore 64 which many amateurs may find useful to have in the shack.

STATION LOG

Joseph Ortuso VK7NJO
43 Bayfield Street, Bellerive, Tas. 7018

```
5 PRINT"■"
10 PRINT"■■      A STATION LOG PROGRAM FOR THE":PRINT
15 PRINTTAB(13)"COMMODORE 64":PRINT
20 PRINT"         WRITTEN BY JOSEPH ORTUSO":PRINT
30 PRINTTAB(16)"VK7NJO"
50 FORI=1TO2000:NEXTI
110 DIMN$(1000)
120 C=0:I=1
130 READN$(I)
135 IFN$(I)="END"THEN160
140 C=C+1:I=I+1
150 GOTO130
160 PRINT"■"
170 INPUT"ENTRY P!.EASE";E$:PRINT"■"
180 FORI=1TOC
190 IFE$="LIST"GOTO210
200 IFLEFT$(N$(I),LEN(E$))<>E$ANDRIGHT$(N$(I),LEN(E$))<>E$THEN220
210 PRINT"■■"I"■:";N$(I)
215 PRINT
220 NEXTI
9000 DATAVK2DOZ JOHN SSB 57/59 SYDNEY 090386
9001 DATAVK2VDX JOHN SSB 57/59 80MT.SYDNEY TS520S INVER.V DIPOLE 090386
9002 DATAVK2NZL JOHN SYDNEY 090186
9003 DATAF6FGY JACQUES MOBILE 10MT.SSB GMT 0701 270380
9004 DATAI1TYU  ARMANDO MOBILE/MARINE 15MT.SSB. SOUTH CHINA SEA 020980
9005 DATAK2GWW 100580,GM4JLD 060580,DF6TR 080480,VK2VDX 150280,G4DV 030480
10000 DATAEND
10010 FORN=1TO40:PRINT"■";:NEXTN
10020 PRINT" TOTAL:";"■"C"■";"    ■N■EXT    ■A■DD    ■Q■UIT"
10030 GETG$:IFG$=""THEN10030
10040 IFG$<>"N"ANDG$<>"A"ANDG$<>"Q"THEN10030
10060 IFG$="A"THENLIST9000-10000
10070 IFG$="Q"THEN PRINT"■":END
10080 RESTORE:GOTO160
```

This station log program has excellent features for its relatively simple structure and it has been found to be more useful than most others, especially when the writer did not possess a disk drive.

FEATURES

In order to view a specific contact, you may enter the full call or just a few letters of it or the date. This is a very useful feature. For instance, it you require to know how many VK7s you have worked you just input VK7 and the screen will scroll with all the VK7 contacts. Or you may wish to find out how many stations you have worked.

If you want to find out how many contacts you have made in, say 1982, just input 82 and all the 1982 contacts will be displayed.

The program also has two counting routines, the first keeps count of your entries and numbers each one with the corresponding number; the second keeps adding them and prints out the total.

It may be noticed the way that data has been deliberately entered in a non- organised fashion, as an example to show that it is not necessary to follow any structure (which is usually annoying and time consuming when entering large amounts of data).

The only points to remember are that the call sign is to be entered first and the date last.

The program has been used very successfully initially with the datasette and now with a disk drive.

The program will also work with the VIC-20, as it was originally designed for this unit, but some re-formatting will be necessary. ar

QSP

BY-LAWS

Amateurs in Westmount, Canada, assisted by CRRL Counsel Bob Benson, QC, VE2VW, were successful in having the following provision included in a by-law that will regulate the size and placement of antenna structures in their municipality:

This by-law shall not apply to any antenna forming part of a federally- licensed structure.

It was not an easy victory. For two years, the amateurs lobbied their town council and worked to improve public relations. It was important to get the provision in. The by-law limits the horizontal component of antenna structures to 10 feet (3m). That would have eliminated all HF beams — and even wire antennas!

From *CRRL News*, 9th April 1986.

PROPHECY FROM THE PAST

Alan Shawsmith VK4SS
Queensland Historian
35 Whynot Street, West End, Qld. 4101

A prophetic look forward from 50-years back!

My YF sat slowly turning the pages of old *Amateur Radios*, digging ever deeper into history. I was supposed to be writing but my mind was occupied with the Jim Linton/Roger Harrison paper on *Future Trends*, particularly the concluding comment, *"... that amateur radio's future lies in information systems and high speed data transfer."*

There-in was my mental sticking point — somehow I just could not buy it. I yearned for the Nostradamus gift of prophecy.

After 50-years of amateur radio involvement, wouldn't it be comforting to be able to predict our *Future Trends*. I thought of all those past revealers who had had the temerity to be prophetic about wireless — and had finished with egg on their faces. A few instances are:

Hertz demonstrating that 'ether waves' travel only in straight line (Marconi proved him wrong); De Forrest, on record as saying that the transistor would never have a place in radio; the 'pundits' who claimed SW was useless for DX; and the endless number of 'naffs' who have been saying for 60-years that Morse would be dead in a decade or less (actually there is more CW activity now than there was 12-months ago and it is not because of low solar activity).

I was brought back to reality by a tap on the arm. The YF handed me a tatty old *Amateur Radio* magazine, dated 1st September 1936. *"There,"* she said pointing to page 11, *"isn't that article remarkably prophetic considering the date it was written."*

Indeed it was — and here it is, full text:

HAM RADIO IN 2036 — (A PROPHECY) by Ron Glassop VK2RF (now VK4BG)

Jim leant back in his shack chair, removed his cans and massaged his ears gently to restore circulation. He felt very pleased with himself, by which you might guess the rig had been getting out to his satisfaction. A glance at his log would have confirmed your judgment. Six QSOs, including four continents, not to mention a new country, all worked within two hours, was the tale it told. What ham with a license dating back only three months would not have felt equally pleased?

A clock struck in the next room with a single reverberating stroke. Jim gave a start at this intimation that the time was 1 am, and only then began to realise how sleepy he felt.

A fire was still smouldering in the comfortably warm shack, and Jim settled a bit lower in the chair, half closed his eyes, and let his thoughts roam unhindered. And as anyone can guess, he was thinking about how good he was at working DX.

"Not such a bad effort," he thought, "with all reports T8 or 9 and at least R6. These electron-coupled oscillators can push out a good note if you go about it in the right way. Wonderful the advances made in the game in the last few years. I suppose if a fellow had worked that string I got tonight about 15-years ago they'd have thought him a marvel; but when you look at it that way, I suppose that I'd open my eyes if I could see a ham station of the future. Say a hundred years from now. A hundred years — a hundred years."

"A hundred years," a voice was saying, as Jim opened his eyes, "that's how long you've been asleep. You've been here in the ham section of the museum all this time. I'm the caretaker, and just noticed you stirring as I was locking up for the night."

"I can hardly believe it," said Jim, "is it really 2036."

"Yes, 2036," said the caretaker. "What a change you'll notice. They'll be asking you to give your impressions at one of the television stations in no time."

"So television is here at last," exclaimed Jim.

"Yes," the caretaker chuckled, "we don't have newspapers now. We see events as they happen all over the world. But I suppose the first thing you want to see is a ham shack."

"You bet," cried Jim enthusiastically; "you must have elaborate shacks now. Where's the nearest ham?"

"Oh, I'm a ham," remarked the caretaker, though Jim noticed that the way he said it did not appear to suggest much pride in his ham status. "I'm VK2XFG8K2."

"What a long call!" said Jim. "What's the idea?"

"Well, there are two million licenses in Australia now, so it's necessary."

"Holy smoke. How do you get through the QRM?"

"There isn't any QRM now. Our automatic receivers can copy through any interference."

"Well, that's a help. Now where's your shack. I'm anxious to see it."

"It's on the 251st floor of this building. We used to be a lot higher, but the missus used to get nervous at the height."

"Cripes, what a skyscraper! By the way, I notice the human race hasn't changed much. All I can see different about you is that your mouth is larger, ears are flatter, and the fingers of your right hand are stumpier."

" Yes, that's the effect of a few generations of hams." replied VK2, etc. (we'll call him that for short). Big mouth from talking into mikes; flat ears from wearing cans; stumpy fingers from pounding brass. However, since there's been no need to do these things we're getting back to normal."

"What!" screamed Jim, "no talking into mikes, no listening, no brass pounding. How can you possibly QSO?"

"Oh, things are much easier now. Here's the shack. Come in and see for yourself."

Jim entered, prepared to see almost anything. He would not have been surprised to see 20 large relay racks end on end, tubes four feet high, and a receiver with 50 tubes. Instead, he could scarcely repress an exclamation of disappointment at the meagre amount of gear in the room. All there was, and there could be nothing hidden, was a closed box-like affair about four feet long, two feet high and two feet deep, and a panel a yard square, covered with push-buttons, each labelled.

"Everything is in the one unit now," said VK2, etc; "it's all automatic, and controlled from this panel."

"I see," said Jim. "How different from my old rig. Now how about some technical details? Tube line-up and all that kind of thing."

"As a matter of fact, I don't know what's inside the box. It's sealed down, and can only be opened by an Amateur Station Service man, in the employ of the World Government."

"What!" howled Jim, "you didn't build it? You don't even know what's inside it?"

"No, of course I don't. You see, any form of experimenting is forbidden now. Years ago it was realised that there wasn't much left to discover, so all experimenting is now left to the Radio Development Department of the World Government, When anyone wants a ham licence he applies, pays the fee of two-shillings, and the Government sends him a rig, with a pamphlet on how to work it."

Visions of hard swotting of theory, countless hours spent copying code, the AQPC, 30-shilling fee, and the building up of his gear flew through Jim's mind. How easy it was to be a ham now. Too easy, in fact. Couldn't be so much fun in it now, he ruminated.

"When I was on the air," said Jim, "we used to get a lot of fun out of building things, having them go wrong and fixing them."

"Yes, it must have been fun," replied VK2, etc, rather enviously, "but what we've never had we'll never miss. Like to see me have a QSO?"

"Go ahead, and you might explain things to me as you go along, like a good fellow."

"Oh, there's nothing much in it. Here's how it works. As we came through the door we broke an electron beam, and that switched things on. Now, who do you want to work?"

"Cripes, is it as easy as that working anyone you want? Well, see if you can raise an EA."

"Yes, we can raise any country at any time of the day these times. Well, to raise an EA, all I do is to press this button labelled CQ, and this one EA. You'll notice that there's a button for every country, in alphabetical order. The pressing of these buttons causes an automatic CQ EA call to go out in a narrow beam straight at Spain. The box contains the antenna, by the way. The outside affairs used to get mixed up with auto. Pressing the EA button automatically points the transmitting and receiving antennas at EA."

He pressed the buttons. "The call is going out now with a thousand kilos behind it. It lasts about 15 seconds, and the transmitter automatically switches over to the receiver as it signs "K" at the end of the call. See that light that just switched on at the bottom of the panel? That means an EA station has answered. The receiver swings around the band until it finds a station calling us. Now you'll notice the light has gone out; that means he's over and we're getting back to him. By pulling the switch we give him an over."

"Very snappy," Jim remarked, flabbergasted at the ease with which everything worked. "What do you — I mean the transmitter — say to him?"

"Oh, just 'Gn om es tnx fer call — vy psd to QSO. Ur sigs hr T9 QSA5 R9 (by the way, all reports are T9 QSA5 R9 now) pse QRK? pse QSL — QRU 73 cuagn gn!'"

"Well," said Jim grimly, "I notice that rubber stamp QSOs haven't changed."

"Of course," explained VK2, etc, "by pressing this button marked 'Ragchew' we would give him a report on the weather and condx. A barometer inside the box does that. But since we were able to control the weather and make it the same everywhere it's hardly worth while. Besides, if I prolong the QSO for more than two minutes the other fellow may be annoyed."

"I see, just like that, eh?" Jim was beginning to feel annoyed at the easy way modern ham radio worked.

"Yes, there's nothing to get worried about now By pulling this tray out of the box we find a slip which has printed on it all the other fellow said. Of course, it's the same as we said to him, so that in the rare case of any QRM we'll know what he said. In fact, I hardly ever bother to read it. By the way, as the transmitter signed sk at the end of the QSO, it automatically printed a QSL card, stamped it, and shot it down a shute to the mail box. The EA will get it by the high-speed plane tomorrow morning. Now, what do you think of the way we do things, old man? Don't you wish you'd had a shack like this?"

"Not a bit of it," yelled Jim, "I wouldn't swap you for a thousand pounds. Millions of hams, practically free licences, no technical knowledge, no building up, no operating, any DX any time; why, you're not a ham at all!"

"What!" yelled VK2, etc. "How dare you insult me? I'll teach you. Take that: and that: and that." He struck Jim on the head with his fist, in a frenzy of rage.

Jim opened his eyes. He was in his own shack, and his brother was standing beside him playfully tapping him on the head with a

dud 45. "Cripes," said Jim, "I've never appreciated this station as much as I do now. Three cheers for 1936!"

Well, Ron may not have got it all right; but then, neither did the famous George Orwell who began to write *Nineteen Eighty-Four* also around 1936 (a prophecy all should read).

This writer was active in 1936 and such futuristic postulations never entered most minds. All were too busy home-brewing and struggling to work DX on QRP (25 watts legal limit).

By the way, in case you don't know, the suggestion of 'sealed' amateur radio equipment has been raised recently by officialdom overseas.

I suddenly realised that Ron VK4BG, is not the only prophet in our midst. Some years ago, Roy Hartkopf VK3AOH, gave us the benefit of his finely-tuned poetic talent with these very pertinent stanzas: (previously published in Amateur Radio).

AMATEUR RADIO — 2004
I've got a new transceiver
It's synthesised of course.
It sends all modes and RTTY
And generates the Morse.

It's got a micro in it
Which calls and logs them too.
It prints the QSL cards,
There's nothing *left to do.*

And so I'll lock the shack up
And let it have a ball.
I'll go weed the garden
It won't need me at all!

Roy VK3AOH.

Ron Glassop VK4BG, author of *2036.*

"Honey," I said to the YF *"let's do something that makes us feel more human. Quit work. I'm gonna turn on the rig — have a bit of a DX phone rag-chew with someone who can entertain me with his larynx and mind, instead of a computer. And then we'll go down to the local social club and chat eyeball with someone — anyone — about anything!"* ar

Thumbnail Sketches

Alan Shawsmith VK4SS
Queensland Historian
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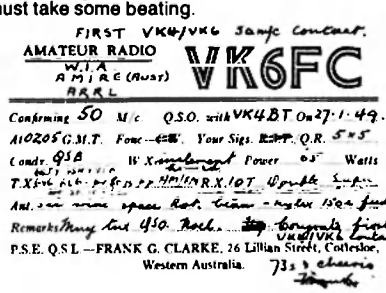
NOEL WHITTAKER ATKINSON
4WK, VK4NA, VK4BT (SK)

Noel, nicknamed *Dohert* by the boys, gained his licence on 29th July 1929, at the age of 19. His first call 4WK was changed to VK4NA a few months later. It is not known now if Noel preferred to have his own initials in the suffix, or if 'B' class Broadcast Station Warwick wanted 4WK. He retained and used VK4NA for six years, until 1935, then relinquished it for reasons unknown and re-appeared on the bands three years later (1938) with a new call and QTH — VK4BT, of Camp Hill, Brisbane.

Like most of his peers of the 30s and 40s, Noel excelled in home-brewing. Early photographs of his gear show some very neat construction of VHF gear. A perusal of Noel's QSL cards and letters produced many surprises. He was an outstanding operator on HF, VHF, and UHF, and was certainly amongst the immediate post-war pathfinders who extended the frontiers on the latter two bands. There is documented proof that he held several records, vis:

A letter from John Betts VE7EB, confirms a QSO on 10 metres on 16th May 1947, QRPp — VK4BT's power being .04 watt or 40 milli-watts. This surely must take some beating.



Perhaps most startling of all is a card from the late Arthur Burton VK1FE, Heard Island, stating that Noel was heard on five metres in February 1949. Signal report, 2 x 3. Arthur comments on the card that VK4BT was the only one he could copy.

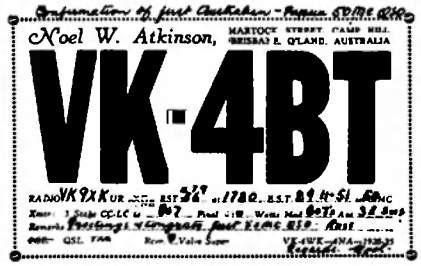
On 21st July 1949, VK4BT QSOed VK6FC, to establish the first ever Queensland/West Australia 50 MHz contact.

The first Australian/Papua New Guinea contact on 50 MHz was with Russ VK9XK, on 29th November 1951 (see QSL card). Russ is still very active on HF CW DX and now domiciled in Brisbane with the call sign VK4XA.

A letter from Jack Coulter VK5JD, of Alice Springs, indicates that his contact with VK4BT was the first Alice/Brisbane QSO on five metres.

During 1950, Noel was the Australian winner of the VHF WIA Contest. On 144 MHz there are QSLs to show that Noel contacted most Australian States, which was a remarkable feat in those days.

What is even more remarkable is that the above DX accomplishments were all made on an input power of 20 watts or less. This means that, with AM type modulation and the inherent losses at VHF, there would most likely be only a few watts circulating in Noel's aerial — a home-brewed multi-element stacked beam.



It could be said that Noel's professional life was all radio. He spent 25- years skilfully conducting his own repair sales and service business, then was employed with DCA for 17 years. For a period he serviced many picture theatres in areas around Brisbane.

Besides amateur radio, VK4BT enjoyed fishing — a pastime popular with most. His manner was easy-going and friendly, as was his approach to on-air QSOs, always conducted in the true spirit of co-operation. He was the kind of chap who would willingly help anyone with a radio problem and on-air QSOs were always conducted in the true spirit of co-operation.

Noel became a Silent Key on 26th October 1979, aged 70-years and the fraternity is much poorer for his passing. He was a long time member of the WIA and is survived by his YF Anne, three sons and a daughter — Noel Jnr, Joyce, Des and Dennis.

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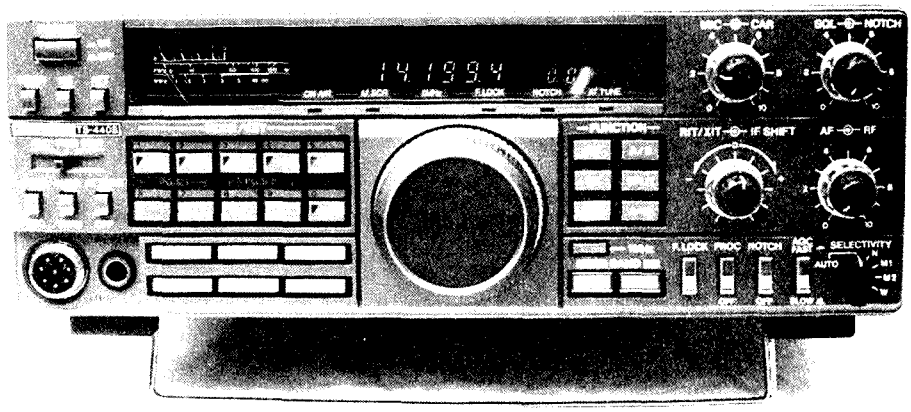
Equipment Review

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

KENWOOD TS-440S TRANSCEIVER



The new Kenwood TS-440S is an upgraded replacement for the TS-430S. Believe it or not, the 430S has been around for just on four years and has been best a seller for Kenwood throughout that period. Even at the end of its run, the 430S was able to compete well with their opposition. I am sure that the 440S will give other amateur equipment manufacturers something to think about.

Firstly, let's look at the 440S and its design features — later we will see how and where it differs from the TS-430S.

The 440S is a compact, 12 volt operated HF transceiver, with a 100 kHz to 30 MHz general coverage receiver. It has all mode capability for SSB, CW, AM, FSK, and FM (all standard features), and incorporates a staggering 100 channel memory system with comprehensive scanning facilities. Selectivity can be selected independently of mode if required or selected automatically with mode selection.

Frequency selection can be made via the normal tuning control or from the front panel *dial up* key pad. An automatic ATU which covers the 80 to 10 metre amateur bands is internally installed as a standard feature. Options include two CW and two SSB filters whilst transceiver metering now included a PEP power output indicator as well as an automatic SWR and ALC position.

Transmitter final amplifier cooling has been improved for 100 percent duty cycle for up to one hour of continuous operation. This will be of great interest to RTTY operators!

The 440S is a triple conversion system with IF frequencies of 45.05 MHz, 8.83 MHz and 455 kHz, compared to the 430S's 48.055 and 8.83 MHz with 455 kHz being used only for the optional FM unit. AM (DSB) reception with the 430 required the optional YK-88A 6 kHz filter, the 440S uses a lower grade filter in the 455 kHz IF section. Oddly, the high grade AM filter is no longer available as an option.

Receiver functions include an IF shift, RIT, and XIT (transmitter offset tuning), noise blanker, AGC switchable for fast or slow decay time (but not AGC off), an audio notch filter, a 20 dB RF attenuator and a squelch control usable on all modes.

Transmitter functions include VOX, semi and full break-in for CW operation, an audio speech processor and an automatic ATU, as mentioned *earlier.*

General functions include a fluorescent tube frequency display to 100 Hz, but easily modified to give a 10 Hz display.

The 440S is capable of computer interface via an RS-232C port, however, whilst the interface unit is available as an optional extra, the required software is not.

The tuning rate is 10 kHz per tuning knob revolution in 10 Hz steps. The tuning rate increases with rapid turning of the knob, but the faster tuning rate is no longer switch-selectable as it was with the 430S.

The RIT/XIT now has a separate read-out for offset and, in addition, the main frequency readout changes by the amount of the offset.

The rear panel contains a multitude of connectors and facilities. There is the usual SO-239 antenna connector, a quarter-inch jack for a key, 3.5 mm jack for an external speaker and a six-pin DC power connector, all conventionally placed.

Three DIN connectors are provided for remote connections. A six-pin connector goes to the optional computer interface unit, while a seven-pin connector provides switching and ALC output for operation of a linear amplifier. A 13-pin connector provides inputs and outputs for audio and data, as well as transceiver microphone muting — presumably used when RTTY is in operation.

The three VOX controls are on the rear panel as are input and output connectors for FSK. A spare connector is also thoughtfully provided.

You might say that this unit has something for *everyone — but* not quite. If you have an AT-250 automatic antenna tuner with your TS-430S and decide to retain this to use with your new 440S (after selling the 430 in Hamads), you may be disappointed. There does not appear to be any way to interface the two units. You could say, *why bother as the 440S includes the AT-440 ATU anyhow.* That's right, except that the AT-250 covers 160 metres whereas the in-built unit does not!.

TECHNICAL DESCRIPTION

The 440S is slightly larger than the 430S, but, even with the built-in ATU, weighs slightly less. It measures 27W x 9.6H x 31.3D cm (38 mm deeper than the 430S) and weighs six kilograms. The rear heat-sink has been increased in size and streamlined. The fan, which is thermostatically operated, is now fitted at the front of the final unit to achieve better air distribution.

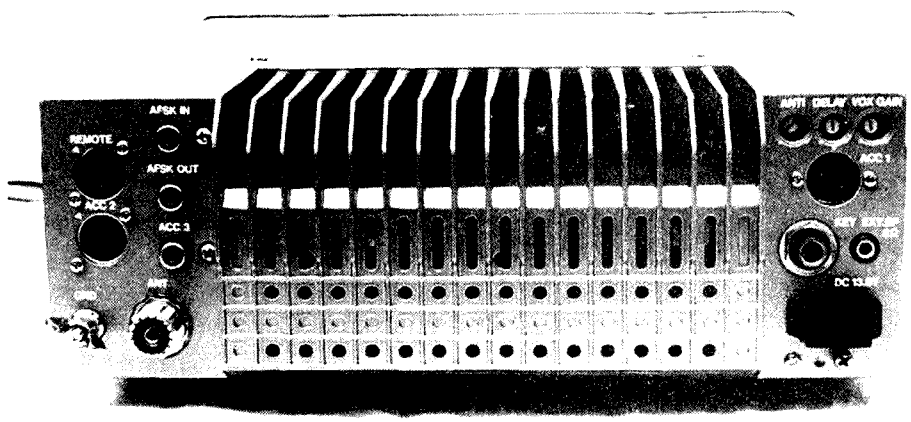
The front panel and main circuit boards are hinged to allow good access to all sections of the interior.

Reference to the block diagram shows, that after front end filtering, the signal goes straight to the first mixer, a pair of 2SK125s in push-pull. Like the 430S, it has no receiver RF stage. A similar pair of FETs are used in the second mixer, therefore, apart from the change of the first IF from 48 to 45 MHz, both units are much the same. But, from this point, things change.

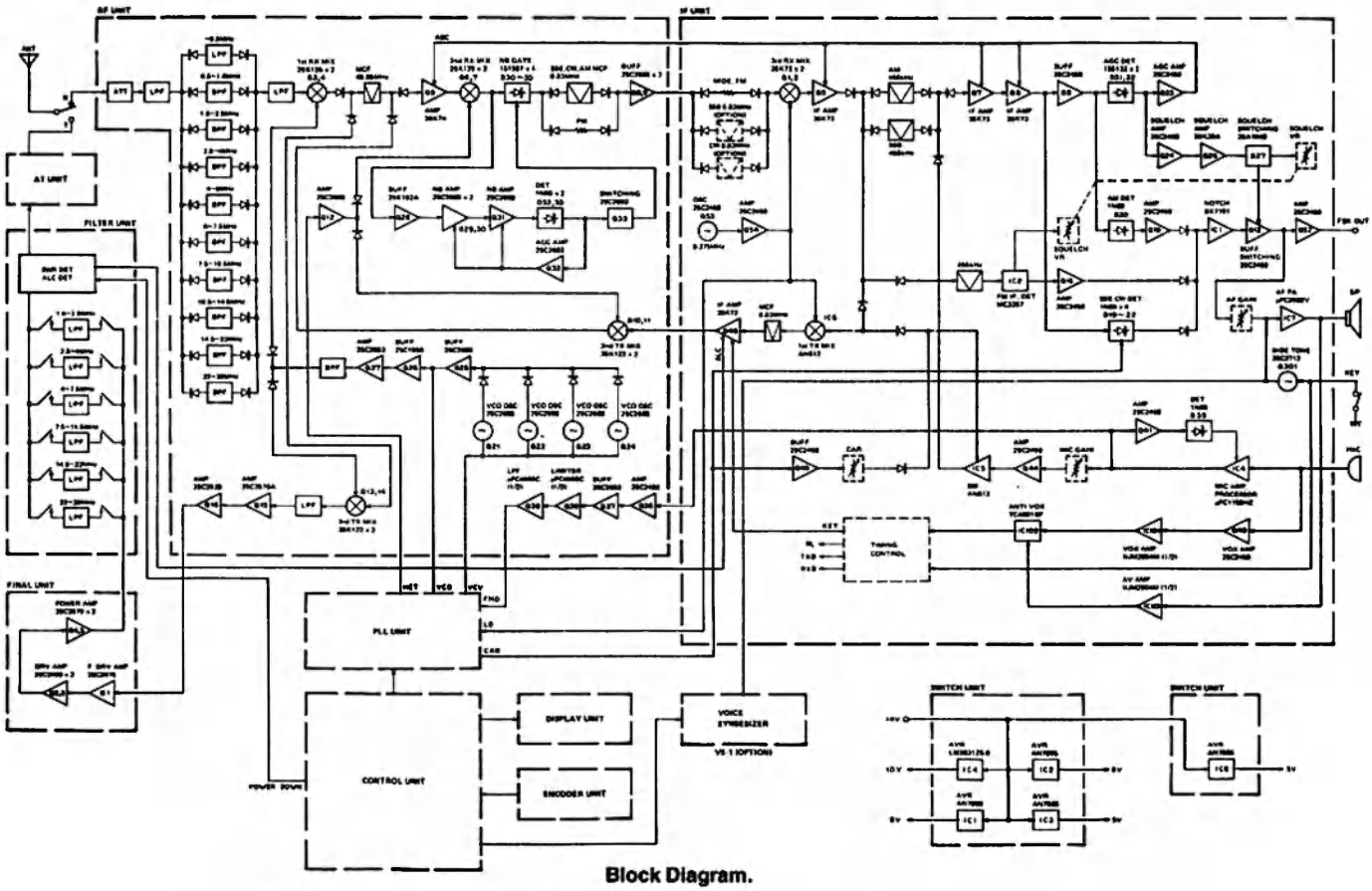
The second IF of 8.830 MHz is now reserved for the optional filters. There is a roofing filter provided with a bandwidth of about 12 kHz, but the main built-in selectivity is now at 455 kHz. With the optional 8.830 MHz filters installed, one of which, the YK-88S is the standard SSB filter in the 430S, they are effectively in series with the 455 kHz filters. In the AM and FM modes, the selectivity is at 455 kHz. Although the AM selectivity is 6 kHz at -6 dB, the same as the optional YK-88A filter for the 430S, it is much wider as we shall see later.

All mixers in the transmitter are push-pull 3SK122s with the exception of the first which is a AN612 IC.

The transmit driver and pre-driver stages use the same line-up as the 430S, but the final has been changed to two 2SC2879s. I have *no* data on these but assume they are up-rated over the 2SC2290s used in the 430S.



Rear view of the unit showing a multitude of connectors.



Block Diagram.

ON-AIR

In general, the TS-440S is a delight to use, however it seems that whenever a new model comes out, some of the best features of the older model get lost on the way. Let us look at them in turn.

The first thing that I noticed was the lack of a finger-hole in the tuning knob — when checking the entire tuning range for spurious signals, I concluded with a rather sore digit. Perhaps, to make up for this, the adjustable tuning knob tension is good, just rotate the ring at the rear of the knob until you have the tension you require. Personally, I would prefer a little less tension so that the knob would have more spin.

The filter switching from the front panel is a great idea, but unfortunately, as the review transceiver did not have any of the optional filters installed, selection was limited to 2.2 kHz for SSB or the wide AM position which is also selectable for Hi Fi SSB. (I would like to try the effect of the YK-88S SSB filter in circuit).

The 440S has only one tuning speed whereas the 430S had two selectable steps. It is possible to get a faster tuning speed on the 440S by rotating the knob at high speed, but, of course, this is not a *tuning* rate. (The faster rate on the 430S was most handy for AM reception).

Perhaps the most intriguing feature of the 440S is the 100 memory capability — I got up to 20 and then ran out of ideas, however, the ease of selection makes the use of the memory system almost preferable to the normal tuning. If you require a channel that is not in the memory, simply punch it in on the key pad.

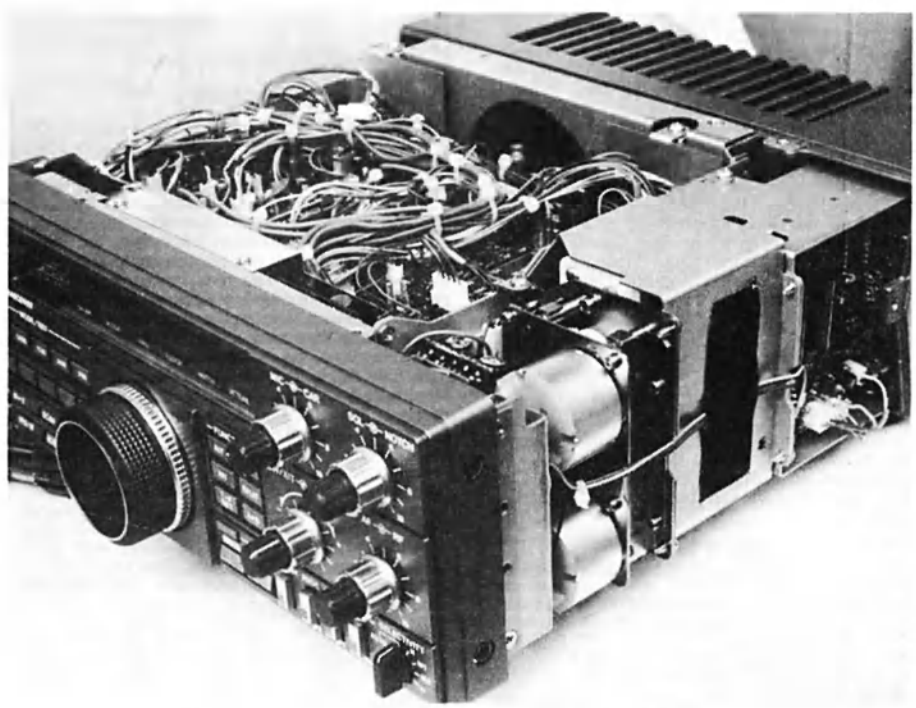
Labelling of the key pad is rather dull (black on gray) so good lighting is necessary in the shack.

The receiver sounded very good with typical Kenwood quality. The internal 7.5 cm speaker is good, but audio quality from the transceiver justifies a good external speaker.

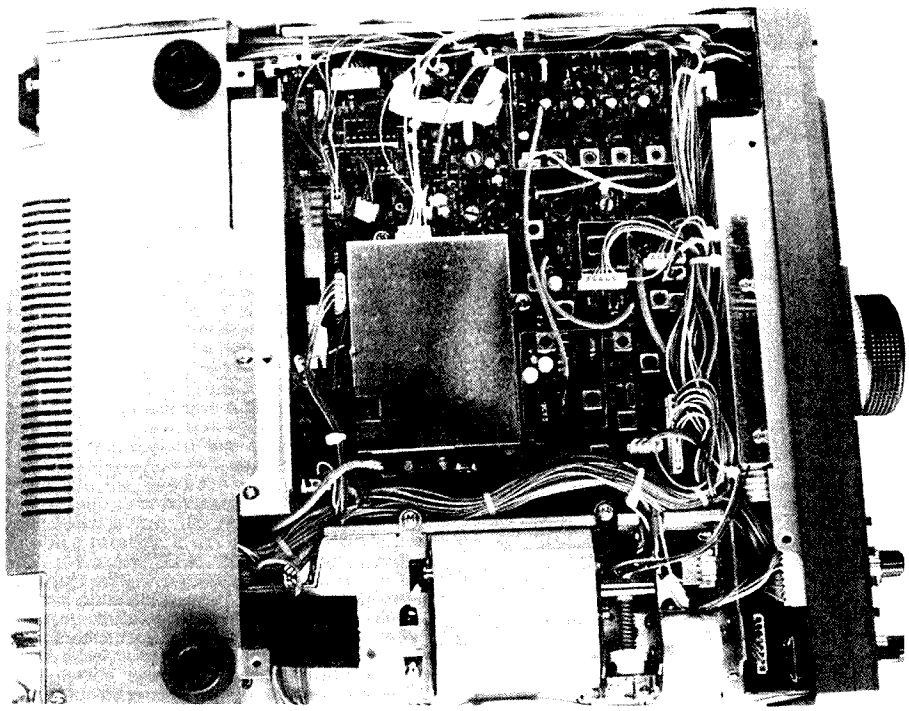
The RIT now has its own digital readout. In addition, the main frequency readout also changes with the RIT. XIT (transmit offset) is also provided. Unlike the TS-930/940, which have an offset capability of 9.9 kHz, the 440S only has a 1 kHz offset.

On the transmitter side, the highlight is undoubtedly the built-in automatic antenna tuner. I would firstly refer readers to my review of the Kenwood AT-250.

Antenna tuners of the AT-250 or AT-440 type are designed to present a 50 ohm load to the transmitter from a coaxial line with a maximum



View showing the ATU in the bottom right-hand corner.



Bottom view showing the internal wiring.

SWR of about 3:1. Don't imagine that you will be able to feed a random length wire or a balanced feed antenna. However, so long as you appreciate the limitations, it will prove quite useful in many ways.

In use, the tuner was easy to use, but I found that the tune-up time was much longer than the tuner in the 930 or 940 transceivers.

New facilities have been provided for the keen CW operator. Full break-in or semi-break-in is selectable with a slide switch on the top left of the cabinet. As I must admit to not being a CW expert, all I can say is that the keying seemed to work very well.

Unfortunately, I was unable to give the FM mode an on air check due to the short time i had the transceiver. I would expect that the performance would be at least as good as the 430S, which is very good. The front panel carrier level control now operates in the FM mode so you do not have to run full power all the time as with the TS-430S.

A lithium battery is built into the 440s to retain memory and VFO frequencies when the DC supply is removed. As there seems to be some controversy about lithium batteries, It is worth noting that Kenwood recommend that the unit should be returned to a Kenwood dealer to have the battery replaced when this becomes necessary. In other words, it is not desirable that you should attempt to do this yourself. It appears that the transceiver will still operate without the lithium battery, but it will naturally ***not*** retain memories after it is switched off.

I think we will have to wait for a few years yet to find out the full effect, or otherwise, of these batteries.

Finally, in common with all current Kenwood gear, a voice synthesised frequency readout is available as an option. This along with the CW mode identification will be boon to sightless operators.

UNDER TEST

The following equipment was used to produce the figures during these tests.

A Drake W4 watt meter, Yaesu YP-150 terminating watt meter, Kenwood SM-220 monitor-scope, Daven audio power output meter, AWA F242A noise and distortion meter, Marconi TF-995A/5 signal generator, a 100 kHz crystal calibrator, and all tests were made with a regulated 13.8 volts applied to the 440S.

Frequency Stability — Stability was checked by running the receiver against VNG for long periods of time. No audible drift was detected. I also ran the receiver in the SSB mode against the ABC Melbourne broadcast stations which have a long term stability of better than 1 Hz. Again, no audible drift was detected. (Kenwood claim a stability of ± 10x10-6.

Transmit Power Output — Power output was measured with full drive under CW conditions and then also checked for PEP output using the monitor- scope. PEP output was checked using both voice and two-tone modulation.

Band	CW O'put	PEP O'put
1.8	117	120
3.5	115	117
7	110	112
10	112	115
14	112	115
18	112	115
21	111	113
24	110	112
28	109	110

It was noted while doing these tests that the power output meter in the 440S was in very close agreement with the above figures.

The scope pattern was very clean at all times and the PEP figures were taken under two-tone conditions with no detectable distortion. On air tests with another station indicated that inter-modulation distortion was acceptably low.

Receiver Tests — The receiver audio was first checked. The extension speaker output was terminated with the audio power meter and connected to the noise and distortion meter. With an 8 ohm load, the residual noise with the audio gain fully off was -64 dBm, an excellent figure. Maximum audio power output was 2.5 watts at 32 percent distortion. At 1.8 watts, 10 percent distortion occurred which is just s bit better than the rated 1.5 watts. At .25 watts (an average listening level) distortion had dropped to 1.6 percent, a quite acceptable figure. The SSB audio response was checked by tuning across a signal from the crystal calibrator. The -6 dB points were at 100 Hz and 2.9 kHz. The curve was quite smooth between these points. The response fro AM receive was checked with the following results.

100 Hz	-10dB	3 kHz	-4 dB
200 Hz	-4 dB	3.5 kHz	-6 dB
400 Hz	-1 dB	4 kHz	-7 dB
1 kHz	0 dB	5 kHz	-12 dB
2 kHz	-1 dB		

This means that you will get quite good quality for broadcast reception, but if you want to uncover weak signals on the short wave broadcast bands, it is not so good. It is a pity that the YK-88A is not offered as an option that could be selected with the front panel selectivity control.

S-Meter Calibration — The S-meter was checked at 14.200 MHz.

S Reading	I'put Signal	Signal Increase
S1	1 uV	
		4 dB
S2	1.6 uV	
		4 dB
S3	2.5 uV	
		4 dB
S4	4.0 uV	
		4 dB
S5	6.3 uV	
		4 dB
S6	8.0 uV	
		4 dB
S7	10.6 uV	
		4 dB
S8	12.5 uV	
		4 dB
S9	40.0 uV	
		8 dB
S9 +10	100.0 uV	
		20 dB
S9 +20	500.0 uV	
		10 dB
S9 +30	1600.0 uV	

The S-meter is calibrated to S9 +60 dB, which represents a signal of 100 mV. I hope you don't strike too many of those on the amateur bands.

The receiver was checked on each amateur band for sensitivity at an input signal of .25 uV. Also, the signal required to give an S9 meter reading.

Freq	S/N Ratio at .25 uV Input	Input for S9
1.8 MHz	7 dB	40 uV
3.5 MHz	14 dB	40 uV
7 MHz	15 dB	40 uV
10 MHz	11 dB	40 uV
14 MHz	14 dB	40 uV
18 MHz	13 dB	40 uV
21 MHz	10 dB	50 uV
24 MHz	7 dB	80 uV
28 MHz	10 dB	50 uV

The receiver input was terminated with a 50 ohm load and the entire tuning range was checked for spurious signals. This is a time consuming job. A total of 27 signals were heard. Mostly they were in the region of .1 to .15 uV equivalent signals with the strongest on 18.561 MHz, which reached about .5 uV. For a triple conversion receiver with coverage from 100 kHz to 30 MHz, this is very good.

Squelch sensitivity was checked in the FM mode at 29.6 MHz. A signal level of .3 uV opened the squelch with it set very finely.

The front end attenuator rated at 20 dB was checked at exactly that figurel The attenuator is very handy for checking the calibration of the S-meter and for giving reports on antenna performance such as front to back ratio readings.

FM performance was checked at 29.600 MHz. With a signal level of .7 uV and 3 kHz deviation, a signal:noise ratio of 15 dB was measured. Squelch sensitivity at the same frequency and in the FM mode was .31 uV.

AGC Performance — AGC threshold was about .6 uV. Signal level was increased from .5 uV to the maximum output of the generator. The increase in audio level was measured at 1.5 dB.

Notch Filter — The notch filter operates in the receiver audio section as distinct from the IF notch filter in the TS—930/940. There are some disadvantages in audio notch filters in that they do not reduce the level of the interfering signal but only the effect of it after detection. Never -the-less the 440S filter does an excellent job. Attenuation was measured at three frequencies with the following results.

500 Hz	-35 dB
1.5 kHz	-35 dB
2.5 kHz	-40 dB

The actual notch is very sharp and so has very little effect on the received audio quality. This does mean that it can be a bit critical to adjust but once you get an idea of where to set the knob for a given heterodyne frequency it becomes easier.

THE INSTRUCTION MANUAL

I must say that Kenwood have improved their instruction manuals. They still have a way to go but the improvement is worthwhile. There is even a page devoted to circuit description.

Sections include: *installation; giving basic details on setting up the transceiver for fixed and mobile operation.*

The operation section firstly describes the function of each control and then goes into detail on frequency selection, memory and scanning setup.

Details are provided on the installation of the optional filters and on the several internal pre-set controls.

Fault finding is limited to operation faults or the *check the antenna is connected* type.

Kenwood do produce excellent service manuals for their equipment and, while I have not seen the 440S version, I would suggest it could be compulsory reading for the enthusiastic owner.

In general, the instructions are well written but one *gem* states *the knobs, front panel and cabinet are likely to become solid after extended use.* So watch out, you have been warned.

CONCLUSIONS

The 440S is a delightful transceiver to operate. I am sure it will be another winner for Kenwood. Now that all modes are included as standard, I would put the 440S near the top of a short list.

Thanks to John Hill, of Emtronics Melbourne, for the loan of our review model.

EVALUATION AND ON-AIR TEST AT A GLANCE

APPEARANCE

Packaging
*** Double carton with foam inserts.

Size
*** Not the smallest, but very acceptable.

Weight
*** Again not the lightest, but certainly very good considering the ATU is in-built.

External Finish
**** Excellent presentation.

Construction Quality
*** Very good construction and accessibility.

FRONT PANEL

Location of Controls
*** Controls cover 57 functions. Layout is remarkable.

Size of Knobs
** A bit on the small size, but good considering the above remarks.

Labelling
*** Very clear except for the key pad numbering.

Status Indicators
*** Six function indicators, plus Morse and light mode indicators.

VFO ACTION

Tuning Knob
*** Good size and adjustable tension, but no finger-hole.

Tuning Rate
** Only one tuning rate selectable. Stepping speed increases with fast rotation of knob.

Digital Readout
**** 100 Hz readout with 10 Hz selectable. Bright and clear readout.

VFO Stability
**** Drift too low to detect.

RECEIVER OPERATION

Memories
**** Breaks all records.

IF Shift
** Useful to adjust audio quality and reduce some interference.

Notch Filter
*** For an audio notch, it works remarkably well.

Spurious response
*** Quite a few but all very low (see test section).

S-Meter
*** Constant 4 dB per S-point up to S9 (see test section).

AGC Performance
*** Smooth action. Fast/Slow selectable, but not off.

Close-up of LED Display.

Signal Handling
*** No cross mod heard except when noise blanker selected.

RIT/XIT
*** Only ± 1 kHz, but separate readout and main readout follows.

Sensitivity
*** Very adequate (see test section).

Pre-amp/attenuator
** No pre-amp, 20 dB attenuator only.

RF Gain Control
*** Smooth progressive action.

NOISE BLANKER

Woodpecker
* No use at all.

Ignition and General Noise
** Good on ignition noise, only fair on power line noise.

RECEIVED AUDIO QUALITY

Internal Speaker
** Not bad for a built-in speaker.

External Speaker
Matching speaker not available for test, very good on my usual station speaker.

SSB/CW Received Quality
*** Low distortion and very clean.

AM Received Quality
*** Good quality for local broadcast stations. Selectivity too broad for AM DX reception.

Headphone Output
*** Stereo headphones compatible. Relative level very good.

TRANSMIT OPERATION

CW and PEP Output
**** Very consistent on all bands (see test section).

Audio Quality
*** With supplied hand microphone, very acceptable.

Audio Processor
** Quite effective if not pushed too hard.

Metering
*** ALC, calibrated power output and auto-SWR.

Relay Noise
*** Very quiet.

CW Operation
*** Selection of full or semi break-in.

Cooling
*** Runs very cool with the new improved heat sink. Fan very quiet when running.

MANUAL

Owners Hand Book
** Somewhat improved over earlier Kenwood manuals, but still more information and better illustrations needed.

OVERALL RATING

**** Although there are a few points of criticism, the overall concept is excellent.

Rating Code: * Poor; ** Satisfactory; * Very Good; **** Excellent.**

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DOC QSP

IT IS ILLEGAL! !

All readers should note that, under the Regulations for the Radcom Act, it is illegal for amateur stations to indulge in conversation with unidentified stations or cause disruptive communications. Amateurs who indulge in such practices are putting their own licence in jeopardy.

NEWS FROM LONDON

CLASS B MORSE NOW PERMANENT

Last year's experiment, allowing British Class B (VHF and UHF) licensees to use Morse on the air, finished on 31st March. During the year, the RSGB, on behalf of the DTI, issued over 6000 letters of temporary variation of the licence, to those wishing to participate in the experiment.

On 2nd May, the DTI announced that following the successful completion of the experiment, the concession is now a permanent feature of the B licence, and that the experimental restriction of Morse operation to the station address no longer applies.

Class B licensees can only obtain A licenses (all bands) by passing the 12 WPM Morse test, and this feature allows learners to practice, in the bands for which they are licensed, under real operating conditions, in preparation for the test. There are no specific restrictions for learners, but the DTI recommends that class B Morse operation should be in accordance with RSGB guidelines issued during the experimental period.

These include station identification by telephony before and after a Morse transmission; no operation in parts of a band reserved exclusively for Morse — to avoid interference with regular CW operation; using on/off keying of an audio tone in the channelised (FM) parts of a band; using any authorised keying method in the multi-mode sections of the bands.

Figures released by the DTI on 2nd May show 28 450 class A, and 27 180 class B licensees currently in the United Kingdom.

Contributed from AR's London Correspondent, Tony Smith G4FAI.

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COUNTRY UPDATE ON 10, 18 & 24 MHz BANDS

Following is an update of countries which authorise use of the new HF bands.

10 MHz — Algeria; Andorra; Antigua; Argentina; Australia; Austria; Bahamas; Belize; Bermuda; Botswana; Brunei; Canada; Cayman; China; Colombia; Costa Rica; Cyprus; Czechoslovakia; Denmark; Djibouti; Dominica; El Salvador; Faroe Islands; Fiji; France; Gabon; German Democratic Republic; Federal Republic of Germany; Gibraltar; Greece; Grenada; Hondouras; Hong Kong; Indonesia; Ireland; Israel; Italy; Japan; Korea; Luxembourg; Malaysia; Malta; Monaco; Montserrat; Netherlands; Netherlands Antilles; New Zealand; Nicaragua; Nigeria; Norway; Panama; Papua New Guinea; Peru; Portugal; San Marino; Senegal; Solomon Is; South Africa; Spain; Sri Lanka; Sweden; Switzerland; Syria; Tonga; Trinidad; Turkey; United Kingdom; USA; Vanuatu; Western Samoa; Yugoslavia and Zambia.

18 MHz — Algeria; Andorra; Antigua; Argentina; Australia; Austria; Bahamas; Bahrain; Botswana; Brunei; Cayman Island; China; Colombia; Costa Rica; Cyprus; Denmark; Djibouti; El Salvador; Faroe Islands; France; Gabon; German Democratic Republic; Federal Republic of Germany; Grenada; Hondouras; India; Ireland; Israel; Italy; Kuwait; Luxembourg; Malaysia; Monaco; Netherlands; Netherlands Antilles; New Zealand; Nigeria; Norway; Oman; Panama; Peru; Portugal; San Marino; Senegal; South Africa; Sri Lanka; Sweden; Switzerland; Syria; Tonga; Trinidad; Turkey; United Kingdom; Vanuatu; Yugoslavia and Zambia.

24 MHz — Algeria; Andorra; Antigua; Argentina; Australia; Austria; Bahrain; Botswana; Cayman; China; Colombia; Costa Rica; Cyprus; Denmark; Djibouti; El Salvador; Faroe Islands; France; Gabon; German Democratic Republic; Federal Republic of Germany; Grenada; Hondouras; India; Ireland; Israel; Italy; Kuwait; Luxembourg; Malaysia; Monaco; Netherlands; Netherlands Antilles; Nigeria; Norway; Oman; Panama; Papua New Guinea; Peru; Portugal; San Marino; Senegal; South Africa; Sri Lanka; Sweden; Switzerland; Syria; Tonga; Trinidad; Turkey; United Kingdom; USA; Vanuatu; Yugoslavia and Zambia.

from *The ARRL Letter*, 9th May 1986

FIFTIETH WIA FEDERAL CONVENTION REPORT

The Wireless Institute of Australia held its 50th Federal Convention in Melbourne on the 25th, 26th and 27th April 1986.

The evening prior to the Convention was spent in informal discussions on many of the major issues that were on the agenda.

The Convention was opened shortly after 9am on Friday morning by the Federal President, David Wardlaw VK3ADW. David welcomed all Divisional delegates and NZART representatives, Terry Carrell ZL3QL, NZART President, and Jock White ZL2GX, NZART Contest and Awards Manager.

The minutes of the 49th Federal Convention were received and adopted.

REPORTS PRESENTED

The President's Report was received and adopted. David stated that there had been a noticeable change in the Department of Communications (DOC) attitude to the amateur service, particularly with regard to de- regulation. There are on going discussions with DOC in regard to Japanese/Australian visitor's licenses.

The President added that it was unfortunate that the Secretary of the WIA was still not well enough to attend the Convention. Earl Russell VK3BER, had resigned from the Executive and was Acting-Secretary. All delegates wished Reg a speedy return to full health.

The IARU Report was then received and adopted. David, as the WIA IARU Liaison Officer, spoke on the Report. He fore-shadowed the necessity for representation at a Region 3 Administrative Radio Conference for the Fixed and Mobile Service in 1988, where 146 and 148 MHz will come under discussion.

Ross Burstal VK3CRB, presented the Treasurer's Report. Ross stated that the Institute was in a sound financial position at the moment, but would need to keep abreast of cost pressures caused by inflation and the falling value of the Australian dollar on the overseas market.

Brenda Edmonds VK3KT, presented the Federal Education Co-ordinator's Report, and informed the Councillors that the Novice Study Guide was completed and had been forwarded to the DOC examinations section for approval.

The VK/ZL/Oceania Contest Manager's Report was presented by Greg Williams VK3BGW, who indicated that he was retiring from the position and the Institute would need to find a replacement. Jock White ZL2GX, Greg's counterpart in New Zealand, thanked Greg for the work he had done with the Contest, and for his co-operation.

Bill Rice VK3ABP, the Editor of *Amateur Radio* magazine presented the Publications Committee Report and requested that all Divisions ***keep the pressure on members for contributions to AR.***

The Federal Historian, Max Hull VK3ZS, presented his Report and expressed pleasure at the interest shown in the 75th Anniversary activities.

Jack O'Shannassy VK3SP, who had been Chairman of the 75th Anniversary Committee, informed Councillors that he would not be standing for re-election to the Federal Executive.

The President thanked Jack for his service to the Institute over many years, both as a member of Executive and prior to coming on to the Executive when Jack gave valuable advice and assistance in the preparation for WARC 79.

The Federal Technical Advisory Committee (FTAC) Report was presented by Peter Gamble VK3YRP, Chairman of FTAC. Peter said that 1985 had been a very busy year for FTAC. Three papers had been prepared and circulated for comment. These were: *Band-Planning; Packet Radio and Repeaters.* Peter tabled these papers for discussion later in the Convention.

VK1 moved a vote of thanks to FTAC.

Allan Foxcroft VK3AE, presented the Federal Standards Co-ordinator's Report with the comment that the working group dealing with immunity levels is close to resolution and AS2772 on non-ionising radiation has been completed.

VK4 congratulated Allan on his work in the Standards area, but claimed that much of it was beyond their comprehension. Allan replied that he felt that most Divisions were hiding behind this argument and refraining from responding to questions.

The CASPAR Report was presented by Gordon Bracewell VK3XX. Gordon informed the Convention that CASPAR was not a continuous committee, but is reformed as needed by the Executive. In this instance, CASPAR was used to study the draft of Chapter 5 of the revised Amateur Operator's Handbook, and prepare a response.

Michael Owen VK3KI, said it was most helpful having the response from CASPAR as it was prepared by practical people and was useful as a basis for a legal response.

Ron Henderson VK1RH, presented the Federal WICEN Co-ordinator's Report. He commented that it appeared that most WICEN groups have had poor liaison with the Divisions. The WICEN calling frequency of 3.600 MHz has a problem in some areas due to interference.

Neil Penfold VK6NE, presented the Federal OSL Manager's Report. He said that he had difficulty getting forwarding addresses for VK0 cards. The Department of Science would not release information on a person's home address when they were in Antarctica.

The AMSAT Co-ordinator, Graham Ratcliff VK5AGR, presented his report. He pointed out that funds are required to keep the satellite program going. Graham suggested that the WIA could lead the way by donating say, 50 cents per member, to the project and hopefully other societies in the Region would follow suit.

Other reports were received from:
John Ingham VK5KG, Federal Video Tape Co-ordinator;
Ken Hall VK5AKH, Federal Awards Manager;
and *Ian Hunt VK5QX, Federal Contest Manager.*

The Acting-Secretary, Earl Russell VK3BER, presented the Secretary's Report.

The FCM Report contained several recommendations regarding guidelines for the issue of certificates to winners of the WIA contests. They were accepted by the Council. Ian also included revised terms of reference for the Federal Contest Manager. These were accepted by the Council after minor amendments.

The VK2 Division proposed that consideration be given to expanding the Novice sub-band on 80 metres. Council voted against this proposal under existing circumstances, but Council agreed to a motion arising — *that the Institute re-affirms its policy to seek expansion of the 80 metre band, and when this is achieved, an expansion of the Novice sub-band in that band will be reconsidered.*

IMPORT DUTY

Council discussed restoration of the by-law that allowed amateur transmitters to be imported duty free. Michael Owen VK3KI, informed Council that regulations under Section 65(15) of the Radcom Act which will define transmitters, would need to be completed before an approach should be made to the Department of Trade, Industry and Commerce. Council instructed the Executive to proceed with negotiations as soon as appropriate regulations have been made.

1988 CONVENTION

The VK1 Division put forward a proposal that the 1988 Convention be held in Canberra. The Convention would be held in conjunction with other planned Bi-Centennial activities. The Division plans to stage a major Communications Exhibition and sites, including the National Tally Room, have already been booked. The Council agreed to hold the 1988 Federal Convention in Canberra.

DOC ADDRESS

Mr David Hunt, Manager of the Regulatory Operations Branch of DOC addressed the Convention.

He informed the Convention that DOC had agreed to permit limited licensees to use CW in their authorised bands.

Due to changes in the examination fee structure, the credit for a pass in a particular subject is now retained indefinitely. This applies from the date of introduction of the new examination fees; ie February 1986 exam. Negotiations are continuing with the Japanese administration to get permission for Australian amateurs to obtain visitor's licenses in Japan, similar to the arrangement whereby Japanese visitors to Australia are able to get an Australian visitor's licence.

DOC are preparing a new edition of the Amateur Operator's Handbook to incorporate changes in the Radcom Act and subsequent regulations. The Institute is In close consultation with the Department during the preparation of the Handbook. Amateur station licenses that will be issued in the future will refer to the Handbook for permitted frequencies and modes for the various grades of licence instead of having them printed on the licence itself.

David went on to say that the Department was very concerned about the loss of revenue from unlicensed stations. They estimate this loss to be between $6 and $10 million from the Citizen Band unlicensed stations alone. DOC are investigating a system where mobile and portable stations of all services will be required to display a registration label to indicate that they are licenced. The registration labels will have a coded number on them to indicate the licensee and will be a different colour each year. The labels will be posted out with licence renewals. Stations in the amateur service will be allowed as many labels as they require, on request. It will be a condition of licensing that a registration label be displayed. Failure to display a registration label could attract an *on-the-spot* fine of about $50. The Department hopes to be able to contain or reduce licence fees with the Increased revenue from previously unlicensed stations.

The Department has prepared a special oral examination for handicapped persons who are unable to sit a written examination for an amateur licence. A senior officer of the Department would visit the candidates home and conduct the examination on a conversational basis rather than straight questions and answers. Persons who want to request an oral examination should apply in the normal manner, including a medical certificate and supporting statement indicating the disability.

The Department's overall aim is for de-regulation of the amateur service to provide maximum freedom for amateurs to experiment. This has been demonstrated in the DOC attitude to vary Packet Radio and Repeaters. David Hunt then offered to answer questions.

The President asked whether the new computer DOC is installing would allow them to extend the length of a licensing period from 12 months to five years, as a five-year licence is Institute policy. Mr Hunt replied that currently no extension could be made, but he would look at the matter again when the computer was fully up and running.

The President of NZART asked why there should be a charge for a visitor's licence in Australia when it is free in New Zealand. DOC will consider.

VK2 inquired as to the time duration of the oral examination. David Hunt replied that there was no fixed time limit but would normally expect a morning or afternoon. They did not want the candidate to feel under any pressure.

In closing, David spoke on prosecutions. Since the Radcom Act came into force, the minimum fine imposed by the courts so far has been $400 plus confiscated equipment. DOC's success rate has been 100 percent.

The President, David Wardlaw, thanked David Hunt for giving up his time to attend the Convention and speak with the Council.

CALL BOOK

Agenda items dealing with the Call Book were discussed and it was decided to:

a. *Print a separate listing of overseas members and call signs (not list them in with the shortwave listeners as has been done in the past).*

b. Identify WIA members in the Call Book.

c. Not include a members preferred name due to insufficient space in listing.

POSSIBLE OUT-OF-HOURS

It was decided that DOC should be approached to conduct some amateur examinations outside of normal office hours. The Institute could provide some man-power to assist in keeping cost down. The Executive will discuss this matter with DOC at the next joint meeting.

DEMANDS FOR PAYMENT

A motion that QSL cards for which a payment is demanded should not count towards WIA awards was lost. Council agreed that demands for payment for QSL cards was against the amateur spirit but did not want to impose an undue workload on the Awards Manager.

INTERFERENCE

A motion that the WIA undertake investigations and recommend solutions to interference on the two-metre band from adjacent paging systems and to the 80 metre band from the second harmonic from cordless telephones was carried.

Allan Foxcroft told the Council that he had already initiated discussions on the cordless telephone interference with the Department.

FEDERAL COMMITTEE

A federal committee will be formed to investigate increased privileges for Novices and identify any changes that would be required to the syllabus. They will also make recommendations for actions and activities to ensure the long term survival of amateur radio as a hobby.

1986 EXECUTIVE

Federal Executive for the next 12 months was elected. Members are:

David Wardlaw — President;
Gordon Bracewell;
Ron Henderson;
Allan Foxcroft;
Ross Burstal;
Peter Gamble;
Bill Rice;
Peter Wolfenden;
and *Michael Owen.*

This is a very brief summary of the three days work carried out over the ANZAC holiday weekend by your Federal Council. Sessions commenced at 9am and continued to 10.30pm each day.

Equipment Review

Gil Griffith VK3CGG
11 Wills Street, Bright, Vic. 3741

PROGRAMMABLE MEMORY KEYER

Whether you are a newly licensed novice or an old timer, there is no doubt that CW can be a little tiring on the arm if you are still using a hand pump.

With a choice of so many alternatives, from straight hand key to full keyboard and automatic computer sending, I chose the electronic paddle keyer as my primary method of generating Morse as it takes 95 percent of the physical strain off the wrist and arm, yet still leaves full control of the sending.

I had been using a tape recorder to record CQ-calls for contesting, but they can be fiddlely to set up properly, so I felt I needed some solid-state memory.

Although I had seen a few circuits for using memory chips, (see the excellent article in *Amateur Radio*, May 1986), I am not yet much of a kit builder, or home-brewer for that matter, so I had been looking at different commercially built models.

After considering all the facts gleaned on air and from numerous articles, advertisements and brochures, I sent off for the ETM-8C. My key arrived in the post 12 days later, (I love opening presents, don't you?), the delay being in my order arriving nearly a week late to the importer.

First impressions were of its very clean appearance, compact size and light weight. Large paddles with plenty of inertia, even on the lightest spring tension, making it easier to operate even at my highest speed (about 30 WPM). My old Galbraith paddle was a bit light and flexible and I was having trouble when sending at high speed.

The enclosed instructions in good English (also in German), with circuit diagrams and layout, were quite comprehensive and, like all instructions, must be read thoroughly for a full understanding.

The front panel has ON/OFF/SPEED knob, paddles, and weight knob only, with all the other controls on the front of the top panel — easy to get at with either hand! It is worth mentioning that the ETM-8C is a professional keyer built mainly for professional operators and so is built with many other things in mind other than just *good looks*.

The layout, both inside and out is uncluttered and very easy to get at, with all the ICs in sockets and ample space for minor modifications to suit the individual. Simple modifications, such as external keyer connection, internal speaker, remote memory control, or power supply connection, would take a minimum of time and effort to build in. In fact, the only modification I intend is to change the sense of the speed control, which is fast at switch on and decreases with clockwise rotation, although I seem to be getting used to it after about 10 hours use.

Construction is sturdy enough to take a good tumble off the bench and is completely disassembled by removing eight screws.

The main feature, of course, is the memory, and it really is a pleasure to operate. Select either *read* or *write* on the slide switch, then the memory select keys, and the repeat key are all that is needed.

To write, just select *write* on the slide switch, press the appropriate memory button, and send the message. This can be done while going to air, while listening and waiting for your turn, or alone using the in-built side tone monitor. Should the memory fill up, it will stop writing and the LED goes out as the memory re-sets. So you can continue with the message in the next memory if necessary.

I found that I could fit one-and-a-half times the alphabet in one memory using clear spacing. I could also fit a complete three by three call in the same space; ie VK3XXX VK3XXX VK3XXX DE VK3XXX VK3XXX VK3XXX AR K. It only took three goes to get it right!

Sending is extremely simple.

With the slide switch in the read position simply press the desired memory key and the message goes out. To repeat, also press the repeat key and the message will continue until stopped by tapping on the paddle.

The memory push-buttons are not marked but I found it easy to remember the separate messages during an evenings operating. If I forget, I just flick off the VOX on the rig and have a quick listen on the set's monitor.

The other controls include a two-position switch for spacing the memory, a disable switch for the dot-dash memory, and the auto-stop switch.

The circuit is similar to the EA (March 1978) keyer but with memory, the addition of a weight control, and the dot-dash memory disable.

After operating the keyer for a number of nightly sessions, I have programmed the memory with a CQ call, an ident, a QRL? call, and calls to various stations I work on a regular basis. This leaves me a lot more time for writing cards and filling in the log, etc.

All on air comments have been good with reference to both the sound of the keyer and to the improvement in my sending, which is nice to hear.

As the ETM-8C is a professional keyer, you will find that if you listen to the coastal stations; eg VIS, you will probably hear one or two in operation, as the importer began by supplying his working colleagues and has only recently entered the amateur market.

At just over $200 I think it is the best value for money that I have seen on the market.

SPECIFICATIONS

Semi-conductors
1 CMOS Ram (4096 bit)
14 CMOS ICs
3 Transistors
7 Diodes
1 LED

Memories
8 512 bit memory locations (about 50 characters each)
— repeat/tune key for continuous repetition of messages and continuous key- down of transmitter
— automatic delay at the end of messages before reset with two delay times selected by a slide switch
— LED indication of memory operation
— automatic stop and reset at operation of paddles

Keying
— speed range 8-50 WPM
— built-in dot-dash memory which can be disabled by a slide switch
— adjustable dash-dot-pause ratio, default 3:1:1
— built-in side-tone generator
— squeeze feature for iambic operation

Keying Output
— relay keying maximum 250 volts or .5 amps or 25 watts
— transistor keying positive to ground, maximum 65 volts, .1 amp

Power Requirements
4 size AA batteries (built-in battery holder)
— idling current .001 mA (typ)
— relay keying: 20 mA
— transistor keying: 3mA
— additional 6 mA during memory operation

Dimensions and Weight
— 45.5 by 113 by 160 mm (HWD)
— 800 grams without batteries

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

JULY
- 1 *Canada Day Contest*
- 5- 6 *Venezuelan SSB Contest*
- 12-13 *IARU Radiosport*
- 19-20 *Colombian Independence Contest 1986 (Rules this issue)*
- 26-27 *Armadillo Run CW (See May issue)*
- 26-27 *Venezuelan CW Contest*
- 26-28 *MARAC County Hunters CW*

AUGUST
- 9-10 *European CW Contest*
- 16-17 *Remembrance Day Contest (Rules this issue)*
- 16-17 *New Mexico QSO Party*
- 23-24 *All Asian CW Contest (Rules June issue)*

SEPTEMBER
- 13-14 *European Phone Contest*
- 20-21 *Scandinavian CW Activity*
- 27-28 *Scandinavian SSB Activity*

OCTOBER
- 4- 5 *VK/ZL Oceania Phone Contest*
- 4- 5 *IRSA World Championship*
- 11-12 *VK/ZL Oceania CW Contest*
- 15-17 *YLRL Anniversary CW Party*
- 25-26 *CQ WW DX Phone Contest*
- 29-31 *YLRL Anniversary SSB Party*

NOVEMBER
- 8- 9 *Australian Ladies Amateur Radio Association Contest*
- 8- 9 *European RTTY Contest*
- 29-30 *CQ WW DX CW Contest*

VENEZUELAN CONTEST

Times: 0000 UTC Saturday to 2400 UTC Sunday. Phone: 5-6th July. CW: 26-27th July.

This is the 24th yearly contest celebrating Venezuela's Independence. It is a world-wide type contest; therefore do not confine your activity to working YVs only. Use all six HF bands, 10 through to 160 metres. There are four classes: Single Operator, Single and All-band and Multi-operator single and Multi-transmitter.

EXCHANGE: RS(T) plus a QSO number starting with 001.

POINTS: Contacts between stations in different countries, two points. Between stations in the same country zero points, but permitted for multiplier credit.

MULTIPLIER: One for each YV call area, and each country (including own) worked on each band.

FINAL SCORE: Total QSO points from all bands multiplied by the sum of the multiplier from each band.

AWARDS: A plaque to the highest scorer in each class. Medals to the highest scoring single operator in each continent and the Bolivian countries (Bolivia, Colombia, Ecuador, Panama, Peru). Certificates to stations in the Americas working 15 YV stations and 10 different countries: and Asia and Oceania stations working five YVs and 10 countries. Use a separate log sheet for each band, and a summary sheet showing the scoring, your name and address (in block letters), and the usual signed declaration. It is requested that all award applicants include a remittance of US$2 or its equivalent in IRCs. Mailing deadline is 15th August for phone entries and 15th September for CW Post to: Radio Club Venezolano, PO Box 2285, Caracas, 1010-A Venezuela.

REMEMBRANCE DAY CONTEST — 1986

In this issue, I have provided the rules for the 1986 Remembrance Day Contest — the *Big One* for the year.

This year the rules are changed very little from last year, however, I will detail the few changes. These are:

— on VHF, repeat contacts may be made on the basis of two hourly intervals.

— minimum number of contacts for a valid log is 10.

— certificates will be issued under the guidelines endorsed by the recent Federal Convention (see below for details).

— the VK8 area is regarded as a distinctly separate area for State scoring purposes.

These rule changes are minor and should present no real difficulties to entrants. I would like to think that all entrants do make themselves familiar with the rules before entering the contest and also, give warning once more that where logs are untidy or do not meet the requirements of the rules, strong consideration will be given to disqualification; eg no Front Sheet or Declaration, etc.

This contest is one which carries with it a remarkable and quite marvellous tradition. I know that there are some operators who do not go on air at any other time of the year and yet they would definitely never miss-out on operating in the Annual Remembrance Day Contest, in memory of their mates who served and gave their all. There is certainly something very special about this contest.

This year, I will provide a listing of the names and call signs of those Silent Keys whose names are engraved on the Remembrance Day Contest Trophy, and I ask that you please remember them in such a manner that, as you operate, you operate in a way that you know they would approve of.

Here a just a few facts concerning the Trophy which may be of interest to you. The trophy has been won by all Divisions at some stage of its existence, however the VK5 Division has won it on more consecutive occasions than any other. It was during one of these winning runs that the boys *up north* in Darwin asked if they could see the Trophy as they had helped to win it as part of the Division. This request was immediately acceded to. So, can you guess just where the Trophy was sitting on that fateful Christmas Day in 1974, when Cyclone Tracy struck the City of Darwin? It was sitting in all its glory in the lounge room of Henry VK8HA! The house was completely demolished and the Trophy disappeared below the resultant tons of debris. Panic followed by gloom abounded amongst members of the VK5 Divisional Council as the realisation dawned that the precious trophy might now be lost forever, and that we were responsible for it having been sent north in the first place.

I am not sure whether or not the current Divisional President was on the verge of resigning when the news was suddenly received that the Trophy had been recovered, albeit rather battered, rain and salt stained, and in other words — somewhat the worse for wear.

The precious object was returned to Adelaide, where it was handed over to Bob VK5PB, who, at the time, was operating an electro-plating business. He did a very fine job of repairing it and as well as the general cleaning up he finished the replica tower and antenna, the peripheral band and inscribed plate on the base in gold plating. This thus marked that particular part of the Trophy's career as prior to this happening, it had always been silver plated. The silver had, of course, taken a terrible beating during what it had been through, and gold is a better and more lasting finish. The shields, engraved with the various winning Divisions, were left silver.

At a later date, following the winning of the contest by the VK1 Division, there were no more blank shields on the Trophy and there was no suitable space upon which to place additional shields.

I arranged to have a die made and a large number of additional shields punched out of brass sheet. These were identical in size and shape to the existing shields. At the same time, I approached a workmate who was skilled in model making. He had an additional section made to attach to the base. When this work was completed, another friend had the new base section stained to exactly match the original. The work was so meticulously carried out that, unless you turned the Trophy upside down, you could not tell that the base was not made from the one piece of material. My wife, Sylvia, then arranged for the shields to be engraved with the details necessary and with all the shields removed, organised for them to be gold plated. Thus the Trophy was brought to its present state of uniform coloured metal-work.

For those who have seen it, I am sure you will agree that it does look most spectacular and I must, even at this late stage, express our gratitude to all those who assisted in bringing this about.

As a result of the addition to the base, the Trophy would no longer fit into its box so John VK5NX organised for a very nice, new and strong, case to be made in which the Trophy could be transported.

There is a portion of the *Life and History* of the impressive Remembrance Day Contest Trophy.

I will now list the names and call signs of those operators who lost their lives whilst on active service during the Second World War, and who are commemorated with their names being engraved on our Trophy. It is these names you will hear read out as part of the Opening Ceremony prior to the commencement of the Contest.

VK2BQ	F W S Easton	Royal Australian Air Force
VK2JV	C D Roberts	Australian Military Forces
VK2VJ	V J E Jarvis	Royal Australian Air Force
VK2YK	W Abbott	Royal Australian Air Force
VK2AJB	G C Curle	Royal Australian Air Force
VK3DQ	J D Morris	Australian Military Forces
VK3GO	T Stephens	Royal Australian Air Force
VK3HN	J McCandlish	Australian Military Forces
VK3IE	J E Mann	Royal Australian Navy
VK3NG	N E Gunter	Australian Merchant Marine
VK3OR	M D Orr	Royal Australian Air Force
VK3PL	J F Colthorp	Royal Australian Air Force
VK3PV	R P Veall	Australian Military Forces
VK3SF	S W Jones	Australian Military Forces
VK3UW	J A Burrage	Royal Australian Air Force
VK3VE	J E Snadden	Royal Australian Air Force
VK4DR	D A Laws	Australian Military Forces
VK4FS	F J Starr	Royal Australian Air Force
VK4PR	R Allen	Royal Australian Air Force
VK5AF	C A Ives	Royal Australian Air Force
VK5BL	B James	Royal Australian Air Force
VK5BW	J G Phillips	Australian Military Forces
VK6GR	A H G Rippin	Royal Australian Navy
VK6JG	J E Goddard	Royal Australian Air Force
VK6KS	K S Anderson	Australian Military Forces
VK6PP	P P Paterson	Royal Australian Air Force

They shall grow not old as we that are left grow old
Age shall not weary them nor the years condemn
At the going down of the sun and in the morning
We will remember them.

You may note that the number of those listed serving in the Royal Australian Air Force greatly exceeds those in the other branches of the forces — I understand that this is not because being in the Air Force was more hazardous. Prior to the commencement of the war, a large number of amateur radio operators were involved as members of the Air Force Reserve. Thus there were probably more amateurs within the ranks of the Air Force than in the other services.

Perhaps someone who has more knowledge of the history of that era may like to write and provide me with more information regarding such matters. Any further information along these lines would be welcome.

Following are the 1986 Rules in detail.

1986 REMEMBRANCE DAY CONTEST — RULES

This contest is held to commemorate those amateurs who died during WWII, and is designed to encourage friendly participation between all amateurs and to help in the improvement of operating skills of all participants.

This contest is held annually during the weekend nearest the 15th August, the date on which hostilities ceased in the south-west Pacific area.

The contest is preceded by a short opening address by a notable personality, which is transmitted on various WIA frequencies during the 15 minutes immediately prior to the commencement time of the contest. As part of this opening ceremony, a Roll Call of the names of those amateurs who paid the Supreme Sacrifice, is read.

A perpetual trophy is awarded annually for competition between Divisions of the Wireless Institute of Australia. It is inscribed with the names of those Australian amateurs who made the Supreme Sacrifice and so perpetuate their memory throughout amateur radio in Australia.

The name of the winning Division each year is also inscribed on the trophy and in addition, the winning Division will receive a suitable certificate. The winning Division also holds the trophy for the next 12 months, after it is presented at the Annual Federal Convention.

Objectives

Amateurs in each VK call area will endeavour to contact other amateurs:

** in other VK call areas, P2 and ZL on bands 1.8 to 30 MHz, except the 10, 18 and 24 MHz bands.*

** in any VK call area, including their own, P2 and ZL on bands above 52 MHz, and as indicated in Rule 5.*

Contest Period

0800 UTC 16th August to 0759 UTC 17th August 1986.

All Australian amateur stations are requested, as a mark of respect, to observe 15 minutes silence prior to the commencement of the contest. It is during this period that the Opening Ceremony Broadcast, referred to above, will take place.

Rules

1. There will be *two contest categories.*

(a) High Frequency (HF) — for operation on bands below the 52 MHz band.

(b) Very High Frequency (VHF) — for operation on bands from 52 MHz and upwards.

2. In each category there will be *three sections.*

(a) Transmitting Phone

(b) Transmitting CW

(c) Receiving.

Modes applicable to each section are as follows:

(a) AM; FM; SSB; TV

(b) CW; RTTY

(c) Receive (a) or (b).

3. All Australian amateurs (VK call sign) may enter the contest, whether their stations are fixed, portable, or mobile. Members and non-members of the Wireless Institute of Australia are eligible for awards.

4. Cross Mode Operation is permitted. Cross Band Operation is not permitted excepting via a satellite repeater.

5. Scoring Contacts

(a) All contacts score one point.

(b) On all bands a station in another *call area may be contacted once on each band using each mode. That is; you may work the same station on each band on Phone, CW, RTTY and TV.*

(c) On the bands 52 MHz and above, the same station in any call area may be worked using any of the modes listed at intervals of not less than ***two*** *hours since the previous same band/mode contact. However, the same station may be contacted repeatedly via satellite not more than once by each mode on each orbit.*

(d) Acceptable logs for all entries must show a minimum of at least 10 valid contacts.

6. Multi-Operator Stations Are Not Permitted (except as in Rule 7), although log keepers are allowed. Only the licensed operator is allowed to make a contact under his/her own call sign. Should two or more operators wish to operate any particular station each will be considered as a contestant and must submit a log under the individual call sign which applies to that operator.

7. Club Stations may be operated by more than one operator, but only one operator may operate at any time; ie no multi-transmission. All operators at any club station must sign the declaration.

8. Ciphers — for a contact to be valid, serial numbers must be exchanged between stations making the contact. The serial number will comprise ***three figures*** commencing 001 for the first contact and incremented by one for each successive contact. Should the serial number 999 be reached, the serial number will revert again to 001.

9. Terrestrial Repeaters — contacts via terrestrial repeaters are not permitted for scoring purposes. Contacts may be arranged through a repeater and if successful on another frequency will count for scoring purposes. The practice of operating on repeater frequencies in simplex mode is not permitted.

10. Portable Operation — Log scores of operators located outside their allocated call district will be credited to that call area in which the operation takes place; eg VK5XY/2 — this score will be added to the VK2 Division scores.

11. Entries — a log of all contacts must be submitted. This should be in the format as shown in the example and must be on one side of the paper only.

A *Front Sheet* must also be included showing the following information in this order:

Category (HF or VHF). Section (Phone, CW or Receiving). Call Sign, Name, Address, Total Score, Page Tally.

Declaration: "I hereby certify that I have operated in accordance with the rules and spirit of the contest."

Signed: . . . . . *Date:* . . . . .

Logs are to be forwarded to the Federal Contest Manager, PO Box 1234, GPO, Adelaide, SA. 5001.

Envelope to be endorsed REMEMBRANCE DAY CONTEST on the FRONT outside. Entries must be forwarded in time to reach the box number by 26th September 1986. Any entries received later than this date may be used as Check Logs only.

12. Disqualification — see the general disqualification rules as printed in detail in the August 1985 issue of *Amateur Radio.*

Any station observed during the contest as constantly departing from the generally accepted codes of operating ethics may also be disqualified.

13. Awards — certificates will be issued in accordance with the *Guidelines for Certificate Issue Remembrance Day Contest* as adopted by the Federal Convention, 1986, details of which are published below.

Determination of Winning Division

Scores by stations in VK0 are added to VK7.

Scores by VK9 stations are added to the mainland call area which is geographically nearest.

Scores claimed by P2 and ZL stations are not included in the scores of any VK call area.

The formula to be applied to determine the winning WIA Division is as follows:

Total Contacts per Division/Total Licenses per Division times the Weighting Factor.

The Weighting Factor is calculated such that should each WIA Division perform equally as well in 1985 as in the past nine years (averaged) the result would be a seven-way dead-heat.

Consequently, the most improved Division will win the trophy and also earn a revised and lower weighting factor for the following year.

Receiving Section Rules

1. This section is open to all shortwave listeners in Australia, Papua New Guinea and New Zealand. No active transmitting station may enter this section.

2. Contest Times and logging of stations on each band are as for transmitting.

3. Logs should be set out as per the example. It is not permissible to log a station calling *CQ.* The detail shown in the example must be recorded.

4. Scoring will be as per Rule 5 for transmitting with other aspects of that same rule also applying.

5. Club Stations may enter this section. All operators must sign the declaration.

Awards for SWLs

Certificates will be awarded to the highest scorer in each call area. Further certificates may be issued at the discretion of the FCM.

Dupe Sheets

Where stations make a reasonable number of contacts it is most helpful that they use some form of checking system to ensure that they do not have invalid duplicate contacts. A form of sheet which provides a convenient method of making such checks for each band was described in *Amateur Radio,* December 1984, page 54. I would suggest that you should use such sheets. Whilst it is not mandatory that you do so, it would be of assistance to the contest manager if you forward a copy of same, together with your log.

EXAMPLE TRANSMITTING LOG

Remembrance Day Contest 1986

Call Sign: VK1XXX **Category:** HF

Section: (a) Transmitting Phone

DATE TIME (UTC)	BAND (MHz)	MDD-E	CALL	NO SN-T	NO RC-D	PTS
16.8.86						
0800	14	SSB	VK2QQ	001	002	1
0802	"	"	VK6LL	002	001	1
0805			VK5ANW	003	011	1
0807	"	"	ZL2AGQ	004	003	1
0809	"	"	VK4XX	005	007	1
Page 1 of 10					Page Total	40

EXAMPLE FRONT SHEET

Remembrance Day Contest 1986

Category: HF **Section:** (a) Transmitting Phone

Call Sign: VK1XXX **Name:** Joe Brown

Address: PO Box 123, Farm Orchard, ACT. 2611

Total Score: 1498 points

Page Tally	10 Sheets Page	1498 points Score
	1	40
	2	39
	3	40
	.	.
	.	.
	Pages 10	Total 1498

Declaration: I hereby certify that I have operated in accordance with the rules and spirit of the contest.

Signed: J Brown **Date:** 20.8.86

EXAMPLE RECEIVING LOG

Remembrance Day Contest

NAME/SWL NO: L30371. **CATEGORY:** HF

SECTION: (c) Receiving Phone

Date Time (UTC)	Band (MHz)	Mods	Stn CalMng	Stn Called	No Se-nt	No Rcd	Pts
16.8.86							
0800	14	SSB	VK1XXX	VK2QQ	001	002	1
0802	"	"	VK1XXX	VK6LL	002	001	1
0805	"	"	VK5ANW	VK1XXX	011	003	1
0807			ZL2AGQ	VK1XXX	003	004	1
0609	"	"	VK7AL	VK2PS	007	010	1
Page 1 of 7						Page Total	40

Following the Federal Convention, which was held in Melbourne during April, I was honoured to be able to meet and spend some time, during May, with Jock White ZL2GX, who had attended the Convention and then travelled to Adelaide to visit various friends in the Adelaide locality. Jock has been Contest and Awards Manager for the NZART for many years and it was a most convenient visit allowing us to *sound off* to each other regarding all the *grizzles* we both have regarding the running of contests, poor logs submitted by entrants, lack of enthusiasm in some directions, changing of rules, lack of understanding by others as to contest work and administration and all the other many little items which go to keep the life of a contest manager unhappy. (I do have tongue in cheek as I

write this — VK5QX!). During the course of our discussions, we both kept in mind the good of amateur radio as a whole, and also the aim of providing benefit to our members on both sides of the Tasman.

It was to this end that we both agreed that it would be most desirable if the Field Day Contests for both countries were made to coincide, as well as having the Remembrance Day Contest and the NZART Memorial Contest held on the same weekend. Our New Zealand friends run their Memorial Contest for the same reason that we have our Remembrance Day Contest, and it would be most fitting to combine the two. The rules for each contest are totally different, however ZL2GX and myself have seen that it is quite feasible, with both contests coinciding, for any operator, VK or ZL, to actually operate in both contests if he/she should so desire. The same applies to the respective Field Day Contests as well. At this stage, we could not do anything about these contests for this year, so this is just prior notice for next year.

I will provide further details regarding this approach in future issues.

ANNUAL REPORT

My Annual Report to the 1986 Federal Convention was comprised of the following items:

Annual Report — (Pages 1-4).
Guidelines for Certificate Issue, Remembrance Day Contest. HF Contest Championship Rules. FCM's Terms of Reference, Amendments — (Pages 1-3).
Remembrance Day Contest Scoring System — (Pages 1-2).
FCM's Recommendations — (Pages 1-2).
FCM's Requests — (Pages 1-2).

I intend, over the next few months, to provide you with more information regarding these items, however, I provide, with this issue, the details of the *Guidelines for Certificate Issue, Remembrance Day Contest.* These were accepted and approved by the Federal Convention and thus now form a portion of the rules for the contest. I am sure that you will appreciate the reasoning behind this altered approach when you have considered the content of the material carefully.

It may interest you to know that under the old rules in excess of 96 certificates were issued for the 1985 Contest. Some of these were to stations who had really only made a relatively few number of contacts.

You may also have been wondering about the results of the HF Contest Championship Contest for 1985. I would hope that I can soon provide these and I am merely awaiting the results of the VK/ZL Contest for 1985 to become available, as these notes are being written in May.

GUIDELINE FOR CERTIFICATE ISSUE, REMEMBRANCE DAY CONTEST

Certificates will be issued on the following basis:

1. Top scorer in each section (see also 4 below).

2. Top Novice Class *station in each section, but as per proviso 3 below. (N/K calls compete on an equal basis when operating in HF (Novice) Band segments, therefore there is no justification for separate certificates for each different type of* call sign).

3. Where an entry other than the top scorer is concerned (as per 2 above), a certificate will only be issued to a station if that station's score is equal to, or greater than, the average score in the applicable section for that State/Division.

4. Where only one entry *exists in any section, a certificate will only be issued when the score for that entry is equal to, or greater that, the average national score for that category/section of the contest.*

5. On VHF, the top scorer only in each section will be awarded a certificate. (There is no justification for separate certificates for holders of Full; Z or K calls as each compete on an equal basis on VHF).

6. The above rules apply with the understanding, as already determined policy that the Federal Contest Manager has the power of discretion in such matters and may either award additional certificates where he considers it warranted or not issue a certificate if he considers one unwarranted.

The policy presented in detail in the above guidelines falls within the prerogative of the Federal Contest Manager as per General Guidelines already laid down from the 1985 Federal Convention. Certificates for the 1985 contest were issued on the above basis.

This document serves merely to apply the rules in a more concrete manner. If these rules are followed, problems of issuing an excessive number of certificates will be overcome, each certificate will have more value and not be downgraded by such instances where a certificate is issued to the Top Scorer in a Section/State because the entry was the only one from that State.

It is suggested that a similar approach to that shown in these guidelines could be used when considering the allocation of certificates for other contests.

JOHN MOYLE MEMORIAL FIELD DAY CONTEST — 1986 RESULTS

I am very pleased to be able to bring you the results of this contest.

It was very well patronised this year and most entrants seem to have enjoyed themselves. I am also most appreciative of the photographs which have been forwarded to me and I am sure that they will be of interest to you.

A total of 75 logs were received with 54 of these being for stations which were operated in the field. Details are as follows:

24 HOUR DIVISION		8 HOUR DIVISION	
Section (a) Phone, Single Operator			
VK5SJ	3535	VK5QX	1691
		VK3AFW	1365
		VK2ARZ	662
		VK2OD	254
		VK2IV	Check
Section (b) CW, Single Operator			
VK3CGG	2392	VK5DL	384
VK2PA	1440		
Section (c) Open, Single Operator			
VK4BZB	1556	VK2EL	1226
		VK3SP	836
		VK2JM	368
		VK1DA	215
Section (d) Phone, Multi-Operator			
VK3CNE	22713	VK3CMZ	3558
VK3ANR	17614	VK3BIE	3130
VK1WI	9762	VK3DBS	1785
VK1ACA	6388	VK3BSP	1071
VK5AT	5513	VK4RR	977
VK4WIM	2520	VK4BPA	959
VK4WIN	2171	VK6YG	854
VK5ARC	2130		
VK3BCG	1982		
VK5BPA	1771		
VK4WIT	1594		
Section (e) CW, Multi-Operator			
VK8TTY	154		
Section (f) Open, Multi-Operator			
VK3ATM	22178	VK4BHV	1603
VK2WG	21995	VK2HZ	1305
VK3BML	5002	VK4BA	Check
VK2FFG	4913		
VK6WIC	4682		
VK5LZ	2708		
VK2LE	2200		
VK4HM	1549		
VK6ANC	1405		
VK6TJ	1129		
VK8DA	544		
Section (g) Transmitting VHF			
VK2DLE	5840	VK3AVJ	4243
VK3YSY	5377	VK3DSI	2649
VK6YL	3392	VK6ZDR	224
VK2ZZX	2060		
Section (h) Home Station, Emergency Power			
VK4AOE	1044	VK5NOD	867
VK6NAE	659	VK2JBM	791
		VK2BQS	527
		VK5AGX	434
Section (i) Home Station			
VK5NY	763	VK3BEE	340
VK3ZI	632	VK1RH	252
VK3YH	610	VK4SF	140
VK3XB	285	VK4RAN	60
VK2PS	282	VK5AJG	Check
VK6WZ	273		
VK4IY	81		
VK3KS	70		

Section (j) Shortwave Listener

L40804	1050
L60036	399

The standard of logs submitted for this contest was generally quite high and where this occurs, it always makes the job of the contest manager so very much easier.

Amongst those submitted, at least two excelled. These were from VK3CNE, the call sign for the North East Radio Group, and the log from VK1WI. The log from VK3CNE was well set-out and very nicely bound, as well as including photographs depicting the wind generators and solar panels. It seems that the idea of provision of natural power and the bonus points attached to it in this contest is beginning to catch on! At this point I feel that I should give credit to Steve VK5AIM, who suggested quite a few years ago, that it should be policy of the WIA to encourage the use of natural power. From this suggestion came a Federal Agenda Item, from the VK5 Division, which was unanimously passed and I found great pleasure in being able to implement this policy by including the Natural Power proviso in the Field Day Contest rules. I am sure that the late John Moyle VK2JU, for whom the contest is named, would have approved wholeheartedly with this action.

Another very good computer generated log was submitted by VK4WIT/P, the Townsville Amateur Radio Club.

Some comments from the entrants follow:

The station was located on Mount Macedon which is situated about 50 km from the City of Melbourne. Power was derived from two wind generators, one giving five amps the other peaking over 20 and consistently 10. There were four solar panels giving a total of eight amps into the 300 amp-hour battery. There was only a short period in the night when there was insufficient nsturs! power and recourse was made to the petrol driven generator. Thank you for running the Field Day, we look forward to participating again next year. Ewen VK3BMV, has promised another wind generator and we plan to have an exercise bicycle for the middle of the night and do away with the generator altogether — VK3CNE. (It appears that VK3CNE is not the only station to consider the use of an exercise bicycle. See photograph — FCM.

It was certainly an experience operating out in the open for the weekend. Setting up antennas, testing them, pulling them down again, testing rigs, setting up tents and much more. I thoroughly enjoyed the whole weekend; from working the pile-ups to BBQ sausages for tea. I'll certainly be first on the list for next years JMMFD group with the Northern Corridor Radio Group. Thanks for an excellent weekend — Nick VK6AFK for VK6ANC/P.

One man operation (I live alone, so I don't have any support people around), I would like to record that all the stations listed in the attached log gave me a most enjoyable weekend. All proving to be most courteous and friendly. In the best traditions of amateur radio — VK6NAE.

My wife, Kath VK2ACP, looked after the meals and some paper work — VK2DLE.

... those who did compete thoroughly enjoyed themselves as always ... We have now had two years to become used to the rules as changed and would like to offer the following comments based upon those two years as well as the last 18 years of continuous operation as a club in this event. 1. The change of rules to reflect distance at VHF has been excellent as far as we are concerned. Definitely a good move. 2. Likewise, the inclusion of the VHF sections, emergency sections, etc. 3. To us, there appears as though there is nowhere near enough publicity given to this event ... Indeed some stations indicated that they wouldn't have minded going in it if they had been aware of it ... it seems to us that out of all the contests, this is just a bit different ... we look forward to next year ... — VK2BXD for VK2WG/P.

Highlights were: the absolute lack of noise compared to the home QTH, hearing and working stations who wouldn't make it at the home 'noise machine' Maurice FT8YA, answering my CQ FD for a 5x7 both ways on 14 MHz, and Dodi HA6NF calling me on Saturday evening for a Jubilee 150 contact for his J150 Award! — VK5SJ. (John has submitted a very comprehensive article dealing with his Field Day exploits over the years which should be published in the near future — FCM).

... strength of signals received here in the 'top end' were very poor ... The operators of VK8TTY were very disappointed at the low number of stations operating RTTY on emergency power in a portable capacity ... VK8DA/P fared a little better because of the poor conditions. 40 and 60 metres were unworkable due to high QRN ... This particular Field Day was not considered very successful in addition to the poor conditions we managed to get a cup of tea spilled over the FT-757, the output of the FT-101E died to three watts and the windmill tower and beam got caught in a wind gust and collapsed during recovery operations — VK8FT for VK8TTY/VK8DA.

I much enjoyed the John Moyle Contest ... I will be in it next year for sure ... I would think that more of the Section (I) entrants could manage Section (h), as emergency power is easy to set up. My home QTH has the batteries ready in

the shack and the solar panel on to keep them charged up at all times. Once again, thanks for the fun — VK3CGG.

I enjoyed the contest very much especially the friendliness of the other operators. Next year, I hope to enter Section (h) with Natural Power. Thanks for all your effort — VK3YH.

. . . this is my first John Moyle Field Day Contest and I did enjoy it . . . I feel that the VHF/UHF multiplier is a good idea but the distances are far too short for the multipliers — VK3YSY.

Thank you for again organising the NFD. I have competed on a small scale for over 20 years, but my days are getting short, although I enjoy the day out. I think the move to March should be good overall. I intended to give you my vote for it last year, but clean forgot it . . . Is it possible to announce the date of the event much earlier — VK2JM. (It is listed in the WIA Calendar and sent out with Amateur Radio at the beginning of the year, Arthur — FCM).

Lead medal of the year should be awarded to the VK3 who, whilst transmitting on phone, refused to give any numbers except to stations operating on CW . . . The decision as to which section is to be entered should be made after the contest, and during the preparation of the log being submitted . . . Once again the VHF participation and scoring is catered for to an extent which is not justified in a National Emergency Test . . . If the VHF operators want to take part in the National Field Day, let them do so under the same scoring conditions as those who are attempting to make a genuine contribution — VK2ARZ. (You might buy some arguments on some of these comments Max — FCM).

I was going to use an old shed on a relatives property at Hazelbrook, in the Blue Mountains. Having scouted out a couple of trees to hang a dipole, I was assured of many contacts! Saturday came, packed all into the car and drove up into 'the mountains' at 4 pm ready to hoist a wire and get started around 6 pm. Horror of horrors — the shed still exists, BUT THE TREES DON'T. Nowhere to even hang a vertical . . . I'm sure next year there has to be a better way of making sure the sky-hook stays in place! Anyway, I very much enjoyed the contest although surprised that more stations were not active on 80 metres on Saturday evening — VK2JBM. (Thanks for your nice log Brian. Better luck next year, but it certainly makes an interesting story — FCM).

All operators at Bulls Head noted on the improved co-operation and general good fellowship between contestants during the contest. The usual crowding and frequency theft was absent and most competitors went out of their way, maybe even sacrificing some points to make the contest an enjoyable but still competitive one. Could this be the start of a new era of co-operation in contests? The 'bad habits' of past contests, I hope, may at last be buried. I hope you agree with me Ian, and trust you may make special mention of this fact in your post contest brief. I realise that the current propagation problems may have some bearing on this . . . All operators and their families who had occasion to participate in the operation at Bulls Head remarked on the valuable experience each one gained in either support or operation of a field communications exercise. Each one expressed an interest in participating next year and look forward to an improved result possibly even a winning score after we include the lessons learnt this year to next years event. Unfortunately, the weekend was not without mishap. The problem associated with the broken dipole, loosening bolts on the generators and the beams rotating with wind power, were relatively easy to overcome. However, I need to point out one problem with the logs. Despite detailed preparations and instructions to the various operators, one sheet of contacts was misplaced and the loss not noticed until after the weekend. (I think you know the feeling). This meant that nine serial numbers from 144 to 152 on our 80 metre log were, in fact, sent twice . . . Isn't he marvellous — 'Murphy.' These problems only highlight the necessity of this contest. I would hate to lose some vital information in the case of an emergency. All amateurs I have recently met expressed their gratitude to you for the honest and impartial attitude you have towards your role as 'umpire' for the various contests run by the WIA. Much has been said lately about a recent contest end I feel that you will maintain a genuine impartial, honest and, above all, a mature approach as you demonstrated recently. To assist you in your validation of both this entry, and others, I have enclosed two extra print-outs. The first is a complete list sorted on call signs. The second is an abbreviated call sign list showing those contacts on VHF and UHF including the remarks field and multiplier calculations as requested — VK1PJ Field Event Co-ordinator, VK1 Division, WIA (VK1WI). (Your remarks are appreciated, Phil and together with comments from others provide me with encouragement. I do however, have to admit that I can make mistakes but I guess that applies to all of us from time to time. The important thing is that one doesn't continue to make them and that they are corrected. I hope that most of my mistakes are only small ones — FCM VK5QX).

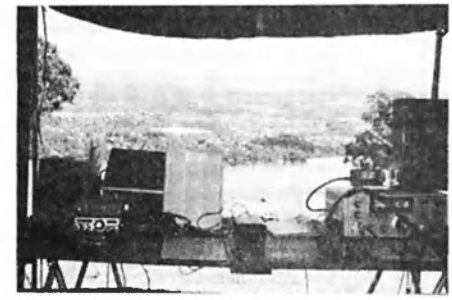
THE VK3CNE JOHN MOYLE CAMP

The Wind Generators. The one on the ladder was being steered off the wind . . . too much current was being generated. The ladder one is about six feet (1.8m) diameter and uses a wind-screen wiper motor and electric drill gear- box, the other is eight feet (2.4m) and uses a car alternator with bike chain drive. There was plenty of wind and the larger unit gave up on the Sunday, luckily there was no cloud and the solar arrays just kept on working! That's them against the car in the other photograph. They were moved around during the day. It was morning when the photograph was taken.

THE WICEN STATION VK6WIC/P FIELD DAY POWER

The Natural Power Source driven by Matthew VK6NSH.

Natural Power driven by Bob VK6KBL, who also built the device.



The VK5BPA Second Adelaide Scout ARC station on Anstey Hill, 15 km north-east of Adelaide. Two metre equipment to the left, HF to the right. The Field Day Contest can be a little slow, so it pays to have a good view — looking over the northern suburbs of Adelaide.

VK5BPA Club Leader, Bob VK5ADR, operating on Anstey Hill, 1216 feet ASL.

Photographs by Peter Koen, Secretary VK5BPA

VK3YSY's station on top of Mount Gisborne.

RESULTS OF PRESIDENT'S CUP COMPETITION

The winner of the President's Cup for 1986 is Gil VK3CGG, who went to a great deal of trouble to operate from the Mount Buffalo Chalet. A short write-up describing Gil's activity was printed in *Amateur Radio*, May issue, page 30. This was only the third time that he had entered into a contest and he is obviously very keen on the CW mode.

Gil deserves the heartiest of congratulations for his effort including the fact that he also went to

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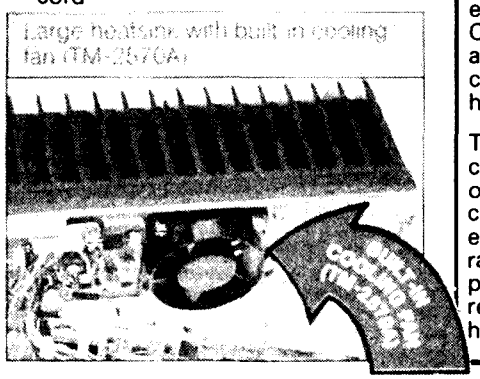

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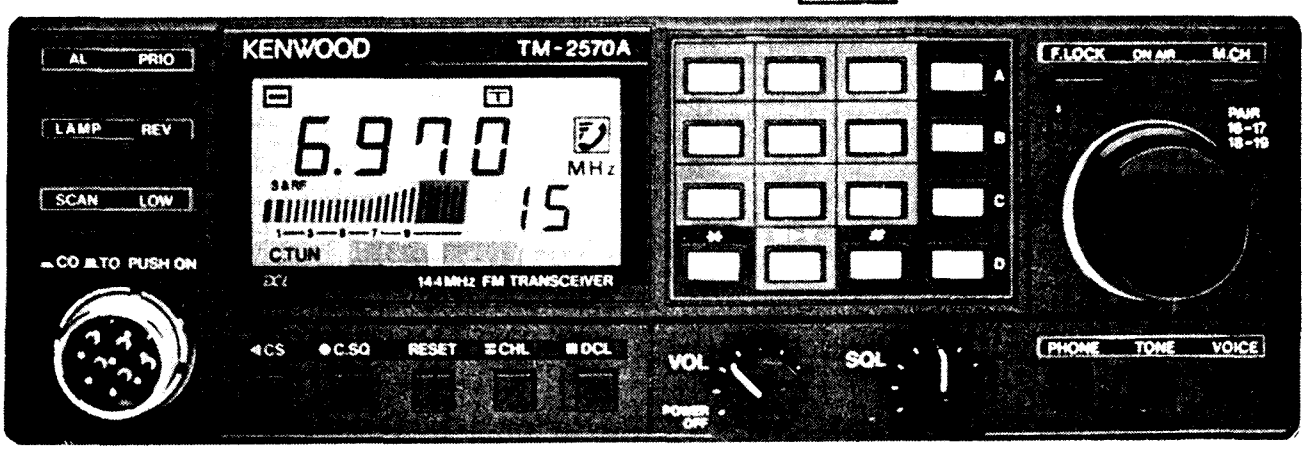

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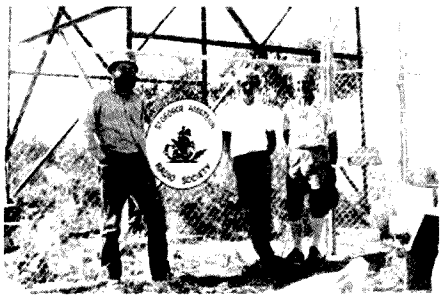
Photograph courtesy D Dawking VK3KX

VK3ATM/P Blue Mountain. The Human Generator and Solar Panels for the VHF/UHF station.



Peter VK2EMV, Alan VK2DQP and Ray VK2CRT, participating for the St George ARS station VK2LE/R

Alan VK2DQP.

Ray VK2CRT.

extra lengths to make sure that his local newspaper had a write-up on the contest. So there we have some excellent PR work on behalf of our hobby. I also know that the manager of the Chalet was most impressed with Gil's activities and thus even more avenues to publicise our hobby may be made available.

REMEMBRANCE DAY CONTEST 1985

This month, I unfortunately find I must finish these notes on a not so happy theme. I have recently been criticised by the Secretary, and apparently members, of the Orange Amateur Radio Club for having mis-handled logs in last years Remembrance Day Contest.

Yes, I did make mistakes in connection with this contest whilst under some quite heavy pressure on a number of counts, however I went to some trouble, even beyond what might have been considered absolutely necessary, to correct the mistakes which I had made.

It is rather a pity that the Club Secretary, himself a previous Federal Contest Manager, did not see fit to write direct to me to try and ascertain what had occurred.

Various other operators from the VK2 Division, whose logs were not listed in the original results, had written directly to me and I was able to overcome such problems. Each person received a personal letter from me apologising for the error. At least one other operator, who will not be named, has written to the Federal Office with complaints and criticism of my actions. I provide an answer to the main complaints in both letters.

There appears to be a total of three logs still not accounted for. These are stated to be VK2DZM and VK2ASY, according to one letter, or VK2DSM and VK2ASY as quoted in the letter from the Orange Amateur Radio Club in the May issue of AR. The other log referred to is that of VK2BNH.

The explanation is basically quite simple. The logs stated as missing for two of the entrants were for only 20 contacts.

This fact is indicated in both letters received. As such, these logs did not qualify as valid logs. If the rules are checked, Rule 5(d) for the 1985 contest stated, *Acceptable logs for all entries must show a minimum of at least 25 valid contacts.* The end result of the complaints as far as missing logs are concerned is that only one log is unaccounted for.

Another criticism voiced by one complainant is the fact that I had the number of VK3 operators incorrectly listed. I quote, *surely a very careless mistake.* Yes, it is easy to see mistakes after the event, I know.

The mistake was, in fact, not basically mine as I was provided with the licensing figures from elsewhere. I suppose I should have double checked them with the Central Office of the Department of Communications.

My final statement on the matter of logs unaccounted for in this instance is that such time has elapsed since the contest that I now consider the matter closed. Had I been properly approached in the first place I might have been more inclined to go to the extra lengths to try and ascertain just what had occurred in the case of the one missing log referred to.

I might add a final somewhat happier comment that, from the very Division which could perhaps have been most irate about my serious error in the contest result, namely the VK1 Division, I have received nothing but courtesy and obvious understanding of a very embarrassing situation. i thank that Division for their forebearance. The VK2 Divisional Council received a letter of apology from me also.

73 de Ian VK5QX

COLOMBIAN INDEPENDENCE CONTEST 1986

This contest will be held from 0000 UTC Saturday, 19th July to 2359 UTC Sunday, 20th July.

Modes are CW and Phone. Only Phone.

Categories:

a Single operator, single band, CW only, Phone only.

b Single operator, multi-band, CW only, Phone only.

c Multi-operator, single transmitter, multi-band, CW only, Phone only.

d Multi-operator, multi-transmitter, multi-band, CW only, Phone only.

(Note: There is only one single-band category ie: Single band operators using 14 MHz compete only in this band).

Bands to be used are 1.8; 3.5; 7; 14; 21; and 28 MHz.

Contest call for Phone — CO HK Contest and for CW — CQ HK Test.

Exchange:

Phone — Signal report plus three numbers starting with 001 (eg 59001).

CW — RST plus three numbers beginning with 001 (eg 599001).

(HK stations will give the number 176 indicating the celebration of the 176 anniversary of Colombian Independence. (eg 59176 or 599176)).

Scoring: With HK stations — 10 points; With non-HK stations outside own country — 5 points; With stations within own country — 1 point.

Multipliers are the combination of different countries worked on each band plus different HK districts worked on each band.

Final score is the total QSO points times multipliers per countries and HK zones per band.

Logs should include Time in UTC; Station Worked; Report Sent; Report Received; multiplier; QSO Points. Separate sheets should be used for each band and each mode. Multipliers should be indicated only the first time they are worked cn each band. A summary sheet should be included with the submission, indicating point computation, category of participation, name and address of operator, list of operators in the case of multi-operator stations, standard contest declaration. Submissions not including summary sheet will be counted as check logs.

Prizes: Every station which shows a minimum of 50 QSOs, at least 10 of which are HK stations for phone entries, or five for CW entries, will receive a certificate of participation. The overall winner of the contest and the winner in each category per band will receive a plaque or cup.

Conditions of entry: Each participant must communicate with at least 10 HK stations on Phone or five HK stations on CW in order to have an entry accepted by the contest committee. Each entrant must submit proof of a total of 50 QSOs, to be eligible for a prize. Only one contact per band with the same station is valid. Cross-band or cross-mode contacts are not valid.

Usual disqualification criteria applies.

Logs should be mailed no later than 30th August 1986, and logs received after 30th December 1986 will not be eligible for consideration, though they may be used as check logs.

All correspondence and logs should be addressed to: LCRA, C/o Direccion de Concursos y Diplomas, Apartado Aereo 584, Bogota — Colombia, Sur America.

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WHAT'S YOUR OPINION?

VHF enthusiasts, what are your thoughts on the Ross Hull Contest which is held each December/January?

Have you any thoughts on this Contest?

Participation is dwindling and entries are extremely disappointing.

The Federal Contest Manager engages in much work and thought to try to make this Contest attractive to all VHFers — are his efforts in vain?

If you have any thoughts which would help enliven this Contest, please write to the Federal Contest Manager, GPO Box 1234, Adelaide, SA. 5001.

Please do not leave it until the Contest is in operation — there is not long until the rules for the 1986/87 Contest will be published — write NOW! ! !

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SPREAD THE WORD

Have you built anything recently? Does it work? Why don't you share it with others? Maybe you think it too simple, or it doesn't look very pretty. So what? Share it with readers of *Amateur Radio* as a very simple project to you may be just what a newcomer is looking for.

CLARENCE D TUSKA — 1896-1985

The last surviving American pioneer of early organised amateur radio, Clarence D Tuska ex-1WD and 1ZT — co-founder and first secretary of the ARRL, as well as co-founder and first editor of *QST* magazine — passed away on 20th June 1985. He was 88.

At the age of 11 he was experimenting with wireless reception, using a coherer, graduating to an electrolytic detector. In 1908, as a high school student, and in need of pocket money, he built several simple receiving sets for consignment sale in a local hobby shop.

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2KGY	Mie
50.020	JA6YBR	Japan
50.060	KH6EQI	Honolulu
50.075	VS6SIX	Hong Kong
50.109	JD1YAA	Japan
52.013	P29BPL	Loloata Island
52.020	FK8AB	Noumea
52.100	ZK2SIX	Niue
52.200	VK8VF	Darwin
52.250	ZL2VHM	Manawatu
52.310	ZL3MHF	Hornby
52.320	VK6RTT	Wickham
52.325	VK2RHV	Newcastle
52.370	VK7RST	Hobart
52.420	VK2RSY	Sydney
52.425	VK2RCB	Gunnedah
52.440	VK4RTL	Townsville
52.450	VK5VF	Mount Lofty
52.460	VK6RPH	Perth
52.470	VK7RNT	Launceston
52.485	VK8RAS	Alice Springs
144.019	VK6RBS	Busselton
144.400	VK4RTT	Mount Mowbullan
144.410	VK1RCC	Canberra
144.420	VK2RSY	Sydney
144.465	VK6RTW	Albany
144.480	VK8VF	Darwin
144.485	VK8RAS	Alice Springs
144.550	VK5RSE	Mount Gambier
144.565	VK6RPB	Port Hedland
144.600	VK6RTT	Wickham
144.800	VK5VF	Mount Lofty
144.950	VK2RCW	Sydney
145.000	VK6RPH	Perth
432.057	VK6RBS	Busselton
432.160	VK6RPR	Nedlands
432.410	VK6RTT	Wickham
432.420	VK2RSY	Sydney
432.440	VK4KBB	Brisbane
1296.171	VK6RBS	Busselton
1296.420	VK2RSY	Sydney
1296.480	VK6RPR	Nedlands
10300.000	VK6RVF	Roleystone

These notes are being prepared whilst touring through New South Wales and unless my next package of mail contains fresh information, will be prepared from existing information I brought with me.

FIVE METRES

I bring you the promised letter from John Allan VK5UL, who says in a note which was attached *"I feel it is worthwhile to bring to the notice of newcomers to our ranks the fact that we have not always been so well informed in matters relative to VHF propagation. Also, I have extended the subject matter beyond my original intention to ensure that the significant contribution made by amateurs during World War II is not forgotten.*

"Dear Eric . . . I look forward each month to reading your contribution to AR, particularly any reference to new VHF DX records made by local enthusiasts. However, it was the weather map and associated comments seen in you column (AR, April 1985), which evoked memories of events 43 years ago.

"My first transmissions pre-war were made on the old five metre band and I, along with others operating on that band, accepted the fact that the best DX we could expect was line-of-sight, give or take a mile or two. In 1936, we were made aware of sunspot peaks when the 10 metre band opened up world- wide. Never-the-less, we still retained the notion that VHF had limited range.

"The thought that prompted this memo is the amazing good fortune of present day beginners, who, through your column and other sources, are able to acquire a good knowledge of the natural phenomena associated with VHF propagation. They could not be blamed for thinking that such knowledge has always been available. This of course is not so and in an endeavour to fix a time when such knowledge, based on actual experience, first became available in this country, I recount my own initial contact. Other operators may have experienced anomalous VHF propagation *prior to 1942 and it would be interesting to read of this in AR.*

"Early in 1942, I completed the RDF (Radar) Course at RAAF Station, Richmond, NSW. After a short stint with a Maritime Reconnaissance Squadron, followed by the installation of the Air Warning System for Brisbane, I was posted to the Directorate of RDF at Air Force Headquarters, in Melbourne. Upon arrival, I was greeted by Roger Choate VK6RK, and John Moyie VK2JU, whom I had had the good fortune to meet the previous year at Laverton.

"The Directorate had been recently established under the command of Wing Commander George Pither, who in the post-war period became VK3VX. There were about nine of us in the Directorate with the Wing Commander the only permanent type. The rest of us were volunteers, mainly from the radio industry and the majority held amateur call signs.

"One morning in September 1942, the Wing Commander called me into his office. He had two charts on his table, one from Fighter Sector, Sydney and one from the Navy. The chart from Fighter Sector displayed the plot of a ship's course compiled from information received from the Radar unit on Gabo Island, ranging out to some 200 miles plus. The normal range for surface vessels from this unit was typical of what could be expected; ie about 30 miles. The plots from Gabo very closely followed the course prepared by the Navy from the ships log after its arrival in Sydney from Auckland. The very serious aspect of this phenomenon was the fact that under long range surface conditions there was virtually no air warning.

"For obvious reasons, the Wing Commander was very concerned and I was ordered to find an explanation for this extraordinary departure from the norm. Nobody in the Directorate could help except that one officer (another amateur) remembered seeing an article in QST *magazine (Circa 1936/7) suggesting that the weather was in some way involved in long range anomalous VHF propagation.*

"Armed with this information, I approached the Weather Bureau in Melbourne. This was not going to be easy, In 1942, anything to do with RDF was top secret *which made it difficult to explain the nature of the problem without transgressing security. The two meteorologists assigned to the project were most sympathetic and understanding. Fortunately, one remembered that temperature inversions extended the range of lighthouses at night, far beyond the distance shown on navigation charts. A check of weather conditions for the period under examination ruled temperature inversions out. However, there was one pattern that seemed to fit consistently and that was the existence of high pressure systems. The meteorologist explained to me the mechanism of the subsidence inversion generally associated with high pressures and subsequent events over the following weeks proved this to be the source of the trouble.*

"There was nothing much at that stage that we could do about it. It did resolve the fears that we had that there may be some problems technically with regard to the equipment and/or our technique. It must be remembered that we were involved with a new technology and had a lot to learn. What we did not realise at the time was the fact that we were helping to make radar history in this country. Incidentally, when I returned to the Directorate with this information, it created something of a furore amongst the amateur fraternity who correctly foresaw the possibility of long range OSOs in the post war period. Subsequent events proved them right.

"There was an interesting sequel. Each day the meteorologists released a balloon with a radiosonde attached which transmitted back information on upper wind direction and velocity; they tracked it with a theodolite, but on overcast days the balloon could disappear after 5000 feet. Could our radar track their balloon? The RAAF had no radar around Melbourne but an Army AA unit at Williamstown agreed to the use of their radar. I had grave doubts that the small package carried by the balloon could reflect sufficient energy to be effective. Not having had any previous experience with this sort of thing, I decided to use two resonant dipoles set at right angles in a piece of garden stake and see what eventuated. It worked very well indeed and was able to track the balloon far beyond any range or height that they had previously experienced with their optical system."

John goes on to say he was eventually posted 2 I C (Radar) to another amateur Wing Commander Morrie Myers VK2VN, who was Chief Signals Officer, 10 Operations Group, later to become First Tactical Air Force, RAAF, spending 16 months on service in New Guinea and the islands. All the four amateurs mentioned above are now silent keys . . . Thank you for your interesting letter, John.

SIX METRES

A letter to hand to my *holiday shack* from Lindsay VK4ALM, accompanying his six metres standings up-date says there has been a shortage of JAs so far this year, with only 10 being worked. Also, there has been a marked decline in the reception of the Russian TV sound on 49.750 MHz, three times to S8/9 and most times S1/3. Other than these, VK1 and VK2 were worked on 29/3; VK2 and VK3 on 2/4; VK8, 3 and 2 on 25/4 and VK2 on 7/5.

The last Es season saw Lindsay adding ZM8OY and VK9LC to his countries total. Some comments on the Ross Hull Contest have been filed for future reference. Thanks for your letter, Lindsay.

SIX METRE AWARDS

John VK4ZJB, as well as sending a standings list up-date, includes a list of awards he has received, which shows what can be done *even with Channel 0 on your back door.* WAJA (JARL) No 931 issued 24/5/82 for all 47 JA Prefectures, including Okinawa; JCG (JARL) No 42, 9/11/81 for 100 JA *Gun* areas; JCC-100, (JARL) No 493 20/12/79 for 100 JA cities; JCC-200 (JARL) No 111, 23/2/81 for 200 JA cities; JCC-300 (JARL) No 55, 26/2/83 for 300 JA cities; AJD (JARL) No 2056, 21/1/71 for all 10 JA areas; 50 MHz-100 (JARL) No 7, 21/7/82 for 100 JA QSOs; VU-1000 (JARL) No 6, 30/9/83 for 1000 JA QSOs, both these on 52 MHz; WAS (WIA) No 90, 10/11/70 for VK1-9 on 52 MHz; VHFCC (WIA) No 78, 3/2/71 for 100 VKs on 52 MHz; WAVKCA (WIA VHF) No 19, 19/1/85 as required by WIA; WAD (NZART VHF) No 107, 22/1/81 for ZL1, 2, 3 and 4; Yokohama DX Club No 381, 30/12/82 for two- way contacts with 16 stations in Yokohama City; WJDXA — Western Japan DX Award No 132, 11/2/81 for working stations in each of the five JA4 prefectures, plus five more in the JA4 area; One Day AJD — The Himeji Amateur Radio Club Award No 1586, 27/11/80 (as for JARL AJD, but worked within 24-hours); NKDXC Award No 2998, 25/12/60 as required by the Northern Kyushu DX Club; CAGOU Award No 261, 22/7/81 for working six FK stations, the Awards is via BP 3956 Noumea plus 10 IRCs; JA 35.20 Award (Class *Special AA)* No 199, 7/8/85 for working stations on 35 degrees 20 minutes latitude as in AR; Worked North Queensland Award No 20, 8/7/70 for Queensland using AX-prefix.

That is a total of 19 awards which surely shows tenacity of purpose plus, of course, a location capable of some sustained JA contacts even during periods of low sunspot activity. It is a good effort indeed when one considers the limitations

placed on operating during television hours. John also has 28 countries confirmed on six metres; six USA States and five other countries heard but no QSO. The USA States worked are Texas, Arizona, California, Washington State, Alaska and Hawaii. John concludes, with a pertinent comment *"there are probably a lot more States which have been worked in yet unpublished logs too!"* I am doing my best to get these operators to send in their logs!

From *The Short Wave Magazine* of March 1986, sent to me by Steve VK5AIM, which reports quite a few operators came on the air for their relaxed provisions on six metres which commenced on 1st February 1986. Early reports speak of relatively high noise levels, although what was surprising that initial tests showed on four metres there was an advantage of 3 dB (presumably signal level) but with slightly higher noise floor levels.

Of course, there are so many variables that it would be difficult to be that specific. One would expect under any form of Es conditions that 50 MHz would be generally superior and with *more* noise than at 70 MHz. Thus equipment, antenna and location parameters need to be considered.

The same magazine stated *"The Irish Government was prepared to issue 50 MHz permits to . . . a small number of qualified experimenters . . ."* Subsequently, EI2W and EI9D, received their permits and a total of 20 will be issued for operation between 50.000 and 51.750 MHz outside peak television hours. Likewise, CT1WW has been granted a 50 MHz licence for use outside television hours.

It is very encouraging to see a continuing availability of 50 MHz from the European sector and, providing TVI problems are not great, we may see some other countries following suit in due course.

THE AURORA

I mentioned in a previous issue some of the effects of the very large Aurora last February, and how it had enhanced signals particularly on two metres. It appears the effects were felt world-wide. Last month I mentioned that Bill Tynan W3XO, was going to say more later, so you may be interested to hear what he had to say in *World Above 50 MHz*, in *QST* for May 1986.

"By now most VHFers and many other amateurs have heard of, or experienced the tremendous geomagnetic event that peaked on 8th February For HF operators, washed-out bands were the result. But for those of us who call the world above 50 MHz our home, it produced some of the most exciting Auroral conditions in many years. All the VHF bands from six metres through 70 cm are known to have been affected.

"The numbers put out by the National Oceanic and Atmospheric Administration *(NOAA) are impressive, to say the least. By 5th February, the 2800 MHz solar flux rose to 103, not a particularly lofty reading for those of us who became accustomed to the 200 plus figures during the last solar peak, but unusual for this low ebb period. Readings in the upper 60s and the lower 70s have been common in recent months. But the real story is told by the magnetic indexes. The Fredericksburg A index can go as low as 0, and quite frequently reaches values of 30 and 50 during magnetic disturbances. On 8th February, it hit 208. The A index is an average for a 24-hour period, with those taken at Fredericksburg, Virginia and Anchorage, Alaska regularly reported in the weekly NOAA report of solar and geophysical activity. The other magnetic index, the K index, is recorded every three hours at the same locations as well as at Boulder, Colorado . . . It employs a different scale than does the A index. In this case, a scale of 0 to 9 is used. A value of nine is very rare indeed, but it was reached during two three-hour periods at Frederickburg on 8th February. (See chart which allows us to trace the progress of the Aurora on the VHF bands).*

"The magnetic fireworks were caused by a spot group that began its energetic activity 3rd February with what is termed an M2/1B class flare. *Several strong radio noise bursts were recorded, the most intense one a 245 MHz value of 51 000 at 1013 UTC 7th February That value normally runs in the few hundred, but often reaches a few thousand during a solar storm.*

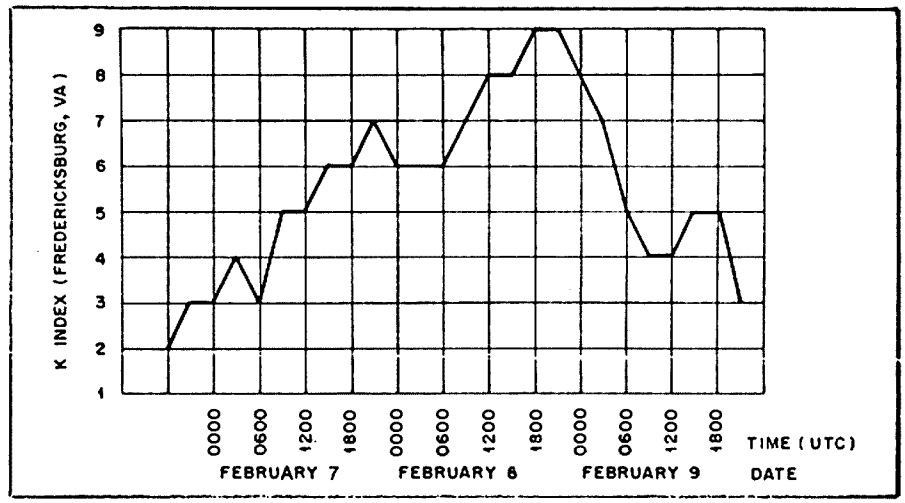

Figure 1 — K Indices for 7th to 9th February 1986. Source: *Preliminary Report and Forecast of Solar Geophysical Data*, 11 February 1986. *(graph by W3EP).* Reproduced in *Amateur Radio* courtesy *QST* magazine, May 1986.

"The bands from six metres through 70 cm went wild. I first got wind of what was to happen when I received a morning phone call from G3COJ. Brian said an Aurora was in full swing there, and that his countrymen, who had received six metre operating privileges just one week earlier, were having a great time. I phoned K1TOL, who was later heard twice by Swedish station, SM6PU. He also heard the GB3SIX beacon on 50.018 MHz, but no two-way contacts were made across the pond. *Hundreds of Auroral contacts were made during the afternoon and evening of 8th February, with openings from much of the US to several South American countries being reported. FY7THF, the French Guiana beacon on 50.038 MHz was heard widely around midday, as was HC2FG, the Ecuador beacon on 50.100. A number of transcontinental contacts were made, apparently by Auroral-E, which was almost certainly responsible for K1TOL being heard in Sweden and his reception of the G beacon. Auroral-E often forms during or after an Aurora, most frequently in the more northern latitudes. Signals propagated by this mode customarily do not exhibit the buzzy sound usually present on Auroral signals. KH6IAA and KH6HI, worked many West Coast stations and some as far east as Minnesota and Texas.*

"G3COJ, reported using 10 watts to work northern G stations in the UK, as well as PA0XMA. JA1VOK, reported that after hearing television signals from VK on 51.750 MHz, he went on to work VK4TL and VK4FXX. Signals reached S9 +20."

It appears the two metre scene was very lively in the US due to the 8th February Aurora and seems to parallel fairly closely with our observations. A possibly new Aurora record for North America was set at 1348 miles (the US still uses miles!), between KA1ZE and WB0DRL, the previous best being 1232. Two metres was described as sheer bedlam with signals reaching from the bottom end to over 144.250 MHz.

On 70 cm, the same situation existed. Another possible North American Auroral record would be at 1181.5 miles between WB5LUA and W3IY/4. Present reports tend to indicate nothing affirmative whether the Auroral propagation extended to 23 cm. It seems everybody was too busy with contacts on the other bands to give 23 cm a serious try.

The February Auroral spectacular was certainly such in the UK according to *The Short Wave Magazine*. Massive coverages of areas were made mostly on two metres. GI4OMK, worked 16 countries and G4FRX, 23 countries including the Faroe Islands.

THE VK8GB EFFORT

I promised some time ago to pass on to you a list of the countries worked on six metres by some of our outstanding stations. I have pleasure this month to list the efforts of Graham Baker VK8GB, (formerly of Darwin and now of Canberra), who submitted a very professionally laid out list, all in alphabetical prefix order and with all the required details — a very neat effort Graham and for which I thank you.

1. *Tonga A35JT 12/4/82;*
2. *American Samoa AH8A 3/4/82;*
3. *China BY5RA 28/9/84;*
4. *Macau CR9AJ 24/8/78;*
5. *Nauru C21AA 14/8/79;*
6. *Philippines WB5LBJ/DU6 11/10/77;*
7. *New Caledonia FK8EB 7/1/84;*
8. *Tahiti FO8DR 3/4/82;*
9. *Solomon Islands H44DX 26/4/79;*
10. *Korea HL9WI 8/3/78;*
11. *Japan JA1EF 16/9/81;*
12. *Ogasawara JD1ADP 5/5/79;*
13. *Minami Tori-shima JD1YAA 31/3/84;*
14. *Eastern Caroline Islands KC6IN 23/3/80;*
15. *Guam KG6DX 4/3/78;*
16. *Saipan KG6RO 24/9/78;*
17. *Johnston Island KH3AB 28/3/81;*
18. *Hawaii KH6FQ 28/8/81;*
19. *Marshall Islands KX6BU 26/7/79;*
20. *Papua New Guinea P29BB 11/9/78;*
21. *Kiribati T32AB 4/4/84;*
22. *Australia VK5LP 10/4/82;*
23. *Lord Howe Island VK9LC 29/12/85;*
24. *Norfolk Island VK9NS 3/4/82;*
25. *Christmas Island VK9XW 14/3/80;*
26. *Cocos Island VK9ZYX 22/11/81;*
27. *Willis Island VK9ZB 28/11/85;*
28. *Brunei VS5DX 26/11/80;*
29. *Hong Kong VS5AB 5/3/80;*
30. *India VU2JPN 7/3/81;*
31. *USA AA6S 17/4/79;*
32. *Indonesia YC1BZ 22/2/80;*
33. *New Hebrides YJ8KM 8/1/78;*
34. *Venezuela DL3ZM/YV5 5/4/82;*
35. *St Helena ZD7BW 22/3/82;*
36. *Niue ZK2RS 14/4/84;*
37. *New Zealand ZL1MO 31/12/82;*
38. *Kermadec Island ZM8OY 10/12/85;*
39. *Fiji 3D2JT 2/4/82;*
40. *Kenya 5Z4CS 28/3/82;*
41. *Nepal 9N1BMK 2/5/79;*
42. *Trinidad 9Y4LL 10/4/82.*

That is a very impressive total and should give readers a chance to see what they have missed through living elsewhere than Darwin! The inclusion of the dates will give you a chance to compare your logs. Graham has also included a photocopy of the back and front of every QSL card which allows for exact certification of a correct entry in the standings list.

I am still waiting for some Ross Hull Contest feedback — practically nothing has come in so far.

Closing with the thought for the month: *The richest man in the world is not the one who still has the first dollar he ever earned. It is the man who still has his first friend.* 73. The Voice in the Hills.

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If you want continuous coverage, AM/FM wide & narrow with 20 memories we suggest you choose the AR-2002 from GFS

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8D-FB	1.20	1.74	2.58	3.90
10D-FB	0.99	1.44	2.10	3.30
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RG-8/AU	2.20	3.20	4.70	8.00
LDF-450	0.75	1.40	1.80	2.50

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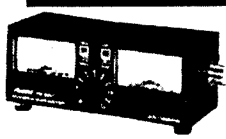
8D-FB	$4.60m	NP-8DFB	$13.60 ea.
10D-FB	$7.00m	NP-10DFB	$14.20 ea.
12D-FB	$9.60m	NP-12DFB	$15.10 ea.

HF-VHF SWR-POWER METER

HS-260



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Fully self supporting & complete with self supporting loaded radials 80, 40, 20, 15, & 10 metres **$299 and $14 P & P**

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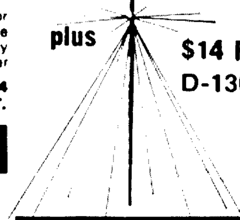
The new D-130 is one of the latest generation full coverage HF/VHF/UHF omnidirectional antennas. It provides continuous operation from 25 to 1300 MHZ and is ideally suited to the likes of the AR-2002 or the ICOM ICR-7000 scanning receivers. Also capable of transmitting on 6m, 2m, 70cm, 33cm, & 23cm bands supplier



PRICE $229 plus $14 P & P

D-130

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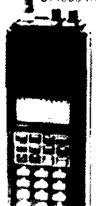
This new unique scanner provides coverage of 26-32, 68-88, 138-176 and 380-514 MHz with a sensitivity of less than 0.5 uV. Four banks of 40 memory channels total of 160 memories. High scan speed of 16 CH/SEC. Auto search and store mode. Priority channel, 4 hour life on supplied Nicad batteries. 24 hour clock. Selectable Scan/Search delay of 0.1 or 2 seconds. Includes Nicads charger, carrying-case and antenna



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$384 + $14 P&P

2 KW DUMMY LOAD

MFJ-250 Low SWR to 400 MHz, 2 KW PEP, supplied with transformer oil.

$109 + $14 P & P

EXPANDED RANGE OF HF-VHF-UHF ANTENNAS

LOG-SP

BROADBAND ANTENNAS

LOG SP – 65 to 520 MHz
$237 + $14 p&p
LOG-S 100 to 520 MHz
$164 + $14 p&p

HF BROADBAND DIPOLES

New T2-FD series provides continuous HF coverage

200 WATT MODELS

3.5-30-T2-FD-200 is 25m long, 3.5-30 MHz
1.8-30-T2-FD-200 is 30m long, 1.8-30 MHz, **both priced at $180 + $14 p & p**

2KW MODELS

3.5-30-T2-FD-2KW is 40m long 3.5-30 MHz
1.8-30-T2-FD-2KW is 50m long 1.8-30 MHz, **both priced at $239 + $14 p & p**

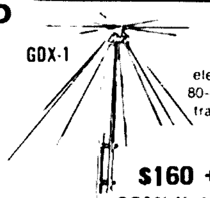
RF NOISE BRIDGE WITH BUILT IN EXPANDER

MFJ-202B

These individually calibrated noise bridges read both inductive & capacitive reactance over a much wider range than the others. Simple to use and covers 1 to 100 MHz **$219 · $14 P&P**

BROADBAND OMNIDIRECTIONAL ANTENNAS FOR SCANNERS

GDX-1



GDX-1 16 element discone 80-480 MHz suits transmitters and receivers.

$160 + $14 p&p

SCAN-X: 6 element discone for receive applications 65-520 MHz
$102 + $14 p&p

FOR THE RTTY OPERATOR

MDK-17 (KIT) MOD-DEMOD

A high performance RTTY/CW modem kit for use on a computer or teletype. Offers high noise immunity on receive. **$156 + $6 p&p (kit) or $241 $8 p&p (assembled).**

MFJ-1224

Versatile RTTY/CW modem, interfaces with a computer and is supplied with software for VIC-20 or Commodore-64 **$402 + $14 p&p**

NOW AVAILABLE ELECTROPHONE 27 & UHF. CB

We now stock the popular range of electophone CB transceivers. For a competitive price and helpful information on which model to use for your application give us a call or simply drop in.

Great Circle Map

Now point your beam in the correct direction using this Great circle Map centred on Melbourne **$2.20 + $3 P&P**

What is stronger than wire of equivalent cross section, non corrosive, non conductive, and has virtually no elongation?

NEW DEBEGLASS WIRE

Now, guy your tower without having to break the wires with dozens of egg insulators, or worrying about them corroding away due to a salty atmosphere. Our Debeglass wire alternative is made using continuous filament fibreglass yarn, jacketed in UV stabilized vinyl chloride. Compare the figures below

	DB-4 (4mm)			DB-5 (5mm)		
	Core diam (mm)	Wt of 200mm (gm)	Tensile Str (kg)	Core diam (mm)	Wt of 200mm (gm)	Tensile Str (kg)
Debeglass	2.5	3.9	430	3.0	[illegible]	560
Steel wire	2.5	5.6	370	[illegible]	[illegible]	[illegible]

DB-4 (4 mm) $0.61m DB-5 (5 mm) $0.86 DB-6 (6 mm) $1.43 Debeclip Termination Clip to Suit DB4, DB5, DB6 $5.45 each. Simple to use Debelock termination for all sizes $1.65 each

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AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

OSCAR-10 APOGEES
JULY 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st July										
182	2293	0414:42	-22	323					256	11
182	2294	1554:15	-22	139	99	20	104	9		
2nd July										
183	2295	0333:46	-22	314			250	1	260	20
183	2296	1513:19	-22	129	103	12	109	2		
3rd July										
184	2297	0252:50	-22	305	249	-1	255	9	265	28
184	2298	1432:23	-22	120	108	4				
4th July										
185	2299	0211:54	-22	295	254	6	260	17	270	37
5th July										
186	2301	0130:58	-22	286	258	14	265	25	275	45
6th July										
187	2303	0050:02	-21	277	263	22	270	33	282	54
7th July										
188	2305	0009:06	-21	267	268	30	276	41	292	63
188	2307	2328:08	-21	258	273	38	283	50	308	71
8th July										
189	2309	2247:12	-21	248	280	47	293	58	340	77
9th July										
190	2311	2206:16	-21	239	288	56	307	66	25	76
10th July										
191	2313	2125:20	-21	229	300	64	330	72	54	70
11th July										
192	2315	2044:24	-21	220	319	71	5	74	69	62
12th July										
193	2317	2003:28	-21	211	352	75	37	70	78	53
13th July										
194	2319	1922:32	-21	201	29	73	57	64	85	44
14th July										
195	2321	1841:36	-21	192	53	67	70	56	90	35
15th July										
196	2323	1800:38	-21	183	67	59	78	47	95	27
16th July										
197	2325	1719:42	-21	173	77	50	85	39	99	18
17th July										
198	2327	1638:46	-21	164	83	42	90	30	103	10
18th July										
199	2328	0418:19	-21	339					250	-2
199	2329	1557:50	-21	154	89	33	95	22	108	2
19th July										
200	2330	0337:21	-20	330					255	6
200	2331	1516:54	-20	145	94	25	100	14		
20th July										
201	2332	0256:25	-20	320					259	14
201	2333	1435:58	-20	136	99	16	105	6		
21st July										
202	2334	0215:29	-20	311			253	3	263	22
202	2335	1355:02	-20	126	103	8	110	-1		
22nd July										
203	2336	0134:33	-20	301	252	0	258	11	268	30
203	2337	1314:04	-20	117	108	1				
23rd July										
204	2338	0053:37	-20	292	256	8	263	19	273	39
24th July										
205	2340	0012:41	-20	283	261	16	268	27	280	48
205	2342	2331:45	-20	273	266	24	274	35	288	57
25th July										
206	2344	2250:47	-20	264	271	32	280	43	300	65
26th July										
207	2346	2209:51	-20	254	277	41	288	52	320	72
27th July										
208	2348	2128:55	-20	245	284	49	299	60	356	76
28th July										
209	2350	2047:59	-20	236	294	58	316	67	34	73
29th July										
210	2352	2007:03	-20	226	308	65	343	71	57	66
30th July										
211	2354	1926:07	-20	217	331	71	16	71	70	56
31st July										
212	2356	1845:11	-19	208	5	73	42	67	78	49

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685MHz — Summer: 7.064MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGMENTS

Material has been received from Bob VK3ZBB, Graham VK5AGR, UoSAT BULLETINs and AMSAT-TELEMAIL.

EXTRACT FROM JUNE COLUMN

Readers of this column will well remember the following Item in the last issue of *Amateur Radio.*

AMSAT-AUSTRALIA DONATION TO PHASE-3 PROGRAM

Following the success story for 1985 that the AMSAT-Australia Newsletter has been, Graham VK5AGR, recently forwarded a cheque to AMSAT-DL for an amount of $5000, as a donation towards the Phase-3 Program. The $5000 was made up by $3000 from AMSAT-Australia Newsletter Subscriptions, plus donations from the Software Service and proceeds from the PC-1246 Pocket Computer Sales, supplemented by a $2000 donation by the WIA (SA Division), being a significant part of the profits of the 400 VK5 two-metre pre- amplifiers that were marketed by the Equipment Supplies Committee of the SA Division. A large percentage of these pre-amplifiers were purchased by listeners to, and operators of OSCAR-10. This sizable donation is a credit to the untiring efforts of Graham VK5AGR, to whom we are all heavily indebted.

Recently, Graham VK5AGR, received a letter from Karl Meinzer DJ4ZC, on behalf of AMSAT-DL. To quote a section of that letter from Karl . . .

"First of all let me express our sincerest thanks for the donation of DM 7870, as a contribution to the Phase-3C project. The money has been dedicated to the purchase of the Helium Bottle in Phase-3C. The cost of the Helium Bottle was approximately DM 8000.

"Will you also please convey our sincerest thanks to the Wireless Institute of Australia, who contributed part of the amount . . ."

Therefore, AMSAT-Australia members can be justifiably proud in having contributed materially to the Phase-3C spacecraft about to be launched later this year, by supporting the Newsletter during the past 12 months. Members can look forward to a further significant contribution this coming year as there are currently 177 subscribers to the Newsletter (as at 6th May 1986).

Congratulations to all concerned — Take a bow Australia! ! !

AMSAT-AUSTRALIA NEWSLETTER

Graham VK5AGR, the National Co-ordinator of AMSAT-Australia is now producing a monthly newsletter containing updated satellite news, orbital predictions, keplerian data and operating hints and techniques. The objective of the newsletter is to keep the amateur populous informed on the latest information available and to realise funds for the funding of projects or the purchase of an item/s of hardware for a future amateur satellite project, eg Phase 3C, Phase 4 or whatever. The cost of the Newsletter is $15 and cheques made payable to WIA (SA Division), should be forwarded to Graham VK5AGR, QTHR.

OSCAR 10 APOGEES
AUGUST 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
0th August										
212	2356	1845:11	-19	208	5	73	42	67	76	49
1st August										
213	2358	1804:13	-19	198	36	70	59	60	84	40
2nd August										
214	2360	1723:17	-19	189	56	63	70	52	90	31
3rd August										
215	2362	1642:21	-19	179	66	55	78	43	94	23
4th August										
216	2364	1601:25	-19	170	77	46	85	35	99	15
5th August										
217	2366	1520:29	-19	161	83	38	90	26	103	6
6th August										
218	2367	0300:00	-19	336					253	-0
218	2368	1439:31	-19	151	89	29	95	18	108	-1
7th August										
219	2369	0219:04	-19	326					258	8
219	2370	1358:35	-19	142	94	21	100	10		
8th August										
220	2371	0138:08	-19	317			251	-3	262	16
220	2372	1317:39	-19	132	99	13	105	3		
9th August										
221	2373	0057:12	-19	308			256	5	267	24
221	2374	1236:43	-19	123	104	5				
10th August										
222	2375	0016:16	-19	298	255	2	261	12	272	32
222	2376	1155:47	-19	114	108	-3				
222	2377	2335:18	-19	289	260	10	266	20	277	41
11th August										
223	2379	2254:22	-18	279	264	18	272	29	284	50
12th August										
224	2381	2213:26	-18	270	269	26	278	37	294	58
13th August										
225	2383	2132:30	-18	261	275	34	285	45	309	66

To date the Newsletter has been a resounding success within Australia and now comments from overseas amateurs, who have received copies from friends in Australia, indicate that they would like something similar in their own countries.

The Newsletter is basically an eight-page compendium of the nitty-gritties that are relevant in the short-term, items that are out-of-date when printed in this column, and to date it has included some small computer programs specifically for satellite determination, the latest telemetry blocks from OSCAR-10 and OSCARs 9 and 11.

If you are at all interested in satellite communication, this Newsletter is a must.

UOSAT — OSCAR-9

UoSAT-1 CCD Experiment

The CCD imager on UO-9 has been in regular use over the last year on a weekly basis, yielding some quite good images of the Mediterranean. The CCD array used on this spacecraft is an early development device, however, and the image quality is not up to that available from the NOAA/METEOSAT meteorological spacecraft. Therefore, we have not promoted this experiment heavily for other than those who have a technical interest in digital image reception and processing. Experimenters who wish to receive clear images of Earth would find the NOAA/METEOSAT data more rewarding, however the image data from UO-9 provides a technical challenge and good results can be achieved with some advanced techniques.

The considerable upgrade in UO-9 operations as a result of the new DIARY software running on the on-board computer (OBC), which has automated spacecraft functions and rationalised data formats, should now be able to support more regular, reliable and interesting CCD experiments scheduled to commence shortly.

UOSAT-2 OPERATIONS

CCD Experiment

The UO-11 CCD imager and the associated Digital Store and Readout Experiment (DSR) has undergone preliminary tests during 1985, but pressure of work on other spacecraft systems and lack of available staff has placed further development of this experiment below the operations *waterline!* The preliminary tests showed that the CCD imager and the DSR were working, although there were some unexplained features (possibly due to ground-station display equipment!). No further work was carried out on this experiment after September 1985, whilst the team concentrated on other spacecraft systems and software, however most of these tasks are now well under way and some effort can again be spared to explore the CCD experiment.

We plan to recommence CCD and DSR experiments shortly and technically interested experimenters should monitor the 435 MHZ UO-11 downlink for test transmissions. Watch the UoSAT Bulletin Service for details.

VHF Beacon Power

A number of experimenters have reported periods of low output power from the UO-11 VHF downlink on 145.825 MHz. The VHF transmitter is designed so that it's DC power consumption, and hence its RF power output, is directly related to the primary spacecraft power bus voltage — ie the 14 volt battery voltage.

This mechanism automatically protects the spacecraft against excessive power drain at low battery voltages whilst maintaining telemetry/experiment data, albeit at reduced output powers.

This mechanism can be observed in operation when the spacecraft is in eclipse. As the battery voltage drops down towards 12 volts from its normal sunlit 14 volts, the VHF transmitter DC current drops from 95 mA to around 62 mA with a corresponding drop in RF output power from around 435 mW to 250 mW. This power change during eclipse operations accounts for the weaker signals received by stations during evening passes in winter and the recent improvement in the Northern Hemisphere as summer approaches.

OSCAR-10 MODE-L BULLETIN EXPERIMENTS

AMSAT ground-stations have been carrying out a series of experiments aimed at providing a reliable bulletin service via OSCAR-10 Mode-L. The experiments involve transmission of FM and Amplitude Compandored Single Sideband (ACSSB) signals through the Mode-L transponder. The experiments are the first phase of Project Linkup, which will provide bulletin transmissions on OSCAR-10 for relay via terrestrial FM repeaters. ACSSB and FM are being used (instead of standard SSB) to maximise the audio quality of the Project Linkup downlink signal. The ACSSB signals can be received with normal SSB equipment, whilst those with ACSSB receivers will experience enhanced signal-to-noise ratios. The FM transmissions will provide a basis for evaluating the efficiency of ACSSB. Vern Riportello WA2LQQ, is currently acting as the Mode-L experiment station. His equipment includes a water-cooled 7289 amplifier from Chip Angle N6CA, and a 5.5 metre, fully steerable dish with a feed system by Mike Staal K6MYJ.

The ACSSB equipment was designed and built by Project OSCAR President, Jim Eagleson WB6JNN, as part of Project Companion, a joint Project OSCAR, ARRL, and AMSAT project. Stations wishing to receive the Project Linkup bulletins will not need such complicated equipment. The theme of the project is *simple access to Mode-L and Mode-S bulletins*, and a small 70 cm Yagi with GaAsFET preamplifier and a standard 70 cm receiver should provide a decent received signal. Initial results were favourable. The signal-to- noise ratio observed varied between 15 and 17 dB. The first trial bulletin transmission using FM was received with nearly *full-quieting* by K0RZ. AO-10 Mode-L may, in the future, be used to transmit bulletins through gateway stations to terrestrial FM repeaters for local consumption. There are no plans to use Phase-3C, Mode-JL for this function. Spectrum and power demands on Phase-3C Mode-JL will probably rule out FM use. However, Mode-S FM bulletins are a possibility and are being studied. Project Linkup organisers are now actively soliciting Mode-L gateway stations and connecting repeaters for the first trial on-the-air bulletin relays tentatively slated for May. Interested individuals should write to Project Linkup, PO Box 177, Warwick, NY. 10990. A business sized SASE will speed your reply.

JAS-1 JAPAN'S FIRST AMATEUR SATELLITE is scheduled for August 1986!

Translated and Edited by K Wilkinson ZL2BJR, from JARL News and other JARL material. ©March 1986.

Transponders

Both analog and digital, J mode (2m uplink, 435MHz downlink). LSB is used for the analog uplink, and FM for the digital uplink. The downlink is USB. Depending on battery condition and schedule (available via JARL telephone service), either analog or digital transponder will operate (maybe both together on weekends). There may be special times scheduled for SSTV, FAX, and RTTY only.

Analog operation will be limited to *line-of-sight*, real-time QSOs, but digital mode will permit bulletin board (store-and-forward) operation. Uplink EIRP required: about 100W. Uplink antenna gain of 10dBi, transmitter power of 10W should be satisfactory. Don't use a higher uplink gain-power product! Downlink (receive) antenna gain of 15dBi should be satisfactory. With such antenna gain figures, the antenna does not need a rotator for the vertical plane — it can be fixed to point 20 degrees above the horizontal.

Analog (JA-mode) Transponder

Uplink 145.900-146.000 MHz (LSB or CW), Downlink 435.900-435.800 MHz (frequency-inverted to reduce Doppler effect, USB or CW). Don't use FM or AM, or tune up in the satellite passband! On 435.795 MHz there will be a CW/PSK beacon (transponder output of 100 mW) alternating between a 15-second CW sequence — *HI* plus a series of three-digit numbers representing telemetry data such as solar cell status, at about 20 WPM — and 15 seconds of PSK telemetry at 1200 Baud.

Analog Mode Operation

First a loop-back test — find a free downlink frequency (suppose that 435.870 MHz is free) and compute the corresponding uplink frequency (581.800 MHz downlink) MHz = 145.930 MHz in this example. (Use headphones with the receiver, to avoid transmitting receiver noise, and to avoid

audio feedback). Transmit your call sign, and adjust the transmitter VFO to tune in the received signal.

Digital (JD-mode) Transponder

Four uplinks, 145.850/870/890/910 MHz (use FM transmitter), AX.25 level- 2 protocol 1200-Baud. NRZI signal transmitted as a Manchester-coded (biphase) signal; downlink is a PSK-coded NRZI 1200-Baud signal on 435.910 MHz (use an SSB receiver). Bell 202 FSK modems (used in most TNCs are not suitable — use the modem circuit as printed in last month's AMSAT column. The modulator divides down the (32f) clock of the HDLC controller and gates it with the HDLC NRZI output to create the Manchester-coded signal. (Check that the frequency at IC4 pin 2 is 1200 Hz, duty cycle should be 50 percent. Set signal at mic jack to 10 mV pp). The demodulator was developed by JA1TUR for receiving OSCAR-10 telemetry. (Check that frequency at TP1 is about 3200 Hz. Adjust receiver so centre frequency of the downlink signal is about 1600 Hz, and input to demodulator is about one volt pp. The centre-zero meter between IC1 pins six and seven acts like the tuning indicator on some FM receivers). Lock range of this PLL is about 200 Hz, so use RIT to track Doppler shift (± 8 kHz).

Hopefully, a PCB will be available from AMSAT-Australia for the modem circuit (published last month) in the not too distant future. This modem can equally well be connected to other TNCs; ie the VADG TNC running AX.25 or the Commodore 64 User Port using the AX.25 software from TUG mentioned in the last issue of the AMSAT Newsletter.

APOLOGY

Most readers will be aware that I unfortunately missed the deadline for the May issue. It was due to the fact that my employer requested me to travel interstate and I simply overlooked the deadline, and the Editor is very unforgiving. Therefore, for the inconvenience caused I humbly apologise.

This issue is being compiled significantly earlier, as I am making a visit to Japan and I hope to get some more up-to-date information on JAS-1. Therefore, in next month's column we should be able to report more on the launch of JAS-1.

de Colin
ar

SATELLITE ACTIVITY FOR PERIOD 1ST TO 28TH MARCH 1986

1. LAUNCHES

The following launching announcements have been received:

1986-022A	**Soyuz T-15**	March 13	*USSR*
1986-023A	**Progress 25**	March 19	*USSR*
1986-024A	**Cosmos 1736**	March 21	*USSR*
1986-025A	**Cosmos 1737**	March 25	*USSR*
1986-026A	**GSTAR-2**	March 28	*Note 1*
1986-026B	**SBTS-2**	March 28	*Note 2*

Notes:

1. GSTAR-2 was launched from Kourou, French Guiana, on an Ariane vehicle for the Spacenet Corporation, United States.
2. SBTS-2 was launched from Kourou, French Guiana, on an Ariane vehicle for the Embratel Group, Brazil.

2. RETURNS

During the period 25 objects decayed, including the satellite 1986-004A Cosmos 1724.

ar

NEW OSCAR 10 SCHEDULES

Following is the proposed OSCAR 10 transponder schedule from 20th May to 15th August 1986.

Mode B	050 to 119
Mode L	120 to 136
Mode B	137 to 199
Off	200 to 219
Mode B	220 to 244
Off	245 to 049

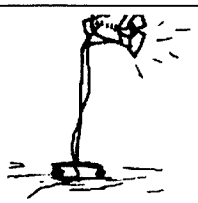
NOTE: As the sun angles and eclipse times change, there may be minor changes in the transponder schedules. Listen to the beacons for the latest information.

LATE NEWS

AMSAT-UK has been given permission to broadcast GB2RS/AMSAT UK News Bulletins on OSCAR-10 any day of the week. Previously broadcast could only be broadcast on Sundays.

The above information is from an insert in *AMSAT-UK OSCAR NEWS.*

ar



Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Well, here we are in the middle of Winter, and ionospheric conditions are very unpredictable. During May, we had several major solar flares, which caused severe disruption to HF communications. I even had difficulty in working a station only 50 km away on 80 metres, during an evening sched.

These storms have brought a lot of pressure on to the 41 and 49 metre broadcasting allocations, yet, even there, reliable propagation has not been guaranteed. Some pundits advanced the theory that it had to do with the nuclear accident in Europe. This occurred at the same time, coincidently, but the experts have so far discounted any correlation between the two events. If there was any noticeable effect, it would have been confined mainly to the Ukraine and Belorussia, and it would have only been for a few hours.

UPDATES

Incidentally, if you wish to stay abreast of daily ionospheric updates, the IPS in Sydney has a recorded information number in Sydney. If you are interested, the number is (02) 26 9864. However, I mainly utilise the weekly IPS summaries that appear on Radio Netherlands *Media Network* and RA's *Talkback,* both presented by Mike Bird. Also, Standard Frequency and Time Station, WWV in Fort Collins, Colorado, has an up-to-date propagation forecast at 18 minutes past the hour. This is, however, not always audible here in Australia. Its companion station in Mauii, Hawaii — WWVH, does not carry the information, relying mainly on disseminating trans- Pacific weather warnings. I do believe that it used to carry this information at one time, but the distance from Colorado precludes this information being included.

BAWDY LYRICS

As I reported last month, the popular *Letterbox* program was axed at the end of April. The administrators at the BBC External Services were inundated with protests, but stuck to their guns!

They hinted that a similar format might be considered next year. There is seemingly a new broom sweeping Bush House. There was considerable controversy over the axing of signature tunes, including *Lily Bolero,* which preceded the World News on the hour. Although listeners wanted it retained, there was another reason why Lily was taken off. The tune hails from Ulster and its bawdy lyrics have been used by protagonists on one side of the sectarian strife that has engulfed that province for centuries. So the BBC wisely decided that the tune should be quietly dropped. The majority of the World Service listeners were completely unaware, presumably, of Lily's connotations.

NEW PROGRAM

While we are on the BBC World Service; as no doubt you are aware, the 13th Commonwealth Games are being held in Edinburgh, Scotland, during this month. So the BBC will be covering this four-yearly gathering of Commonwealth athletes. In fact, they have launched a new program called *Sportsworld,* which will include commentaries and up-to-date reports from several major sporting events, starting from the *World Cup,* in Mexico.

The 13th Commonwealth Games commence on Thursday, 24th July and conclude on 2nd August. The popular Paddy Feeny hosts reports from Edinburgh at 2100; 0215; 0745; 1330 and 1615 UTC, with some live commentary as well in *Saturday Special* from 1345 UTC.

Other major sporting events are going to be covered in July on *Sportsworld,* as well. Test cricket and Wimbledon tennis are extensively covered. The series between India and England has just concluded, and now It Is the turn of the New Zealanders, fresh from their triumph over Australia. You can hear *Sportsworld* live at the First Test Match, at Lords, from the 24th to 29th, from 1115 to 1345. A ball-by- ball commentary for South Asia will be provided on 17.770 MHz from 0945 to 1315 UTC and from the Singapore Relay on 9.740 MHz from 1309 UTC. The latter channel should be audible here, so I will possibly tune to Radio New Zealand from 0945 on MW.

MAJOR EVENTS

Wimbledon comes to a climax on 5th and 6th July, with the Women's and Men's Finals and *Sportsworld* will be there from 1309 UTC. As well, there will be coverage of the British Open Golf Tournament on 19th and 20th July at 1515 and 1715 UTC.

Yet another major event that the BBC World Service will be covering is certainly not in the sporting arena. This is the Royal Wedding between HRH Prince Andrew and Miss Sarah Ferguson, on Wednesday, 23rd July, from Westminster Abbey. At deadline time, no details are to hand, but coverage is likely to be from 0900 and 1200 UTC.

RETIMED

Two DX sessions have been retimed. *Waveguide* on the BBC World Service has now been slotted from Wednesdays at 0430 to Mondays at 0445 UTC. The other releases at 0750 Sundays and 1115 Tuesdays remain unaltered. The Voice of America's (VOA) *Worldwide Shortwave Spectrum* is now on Tuesdays at 1345 UTC in the *Magazine Show* with host Gene Reich.

Last month, I happened to mention that the ARDXC were going to have a DXpedition to Rathdown, Victoria. Well, it did not eventuate as it had to be cancelled because of the apathy of DXers. It is sad that they find it difficult getting together, where they can learn from each other. To get away from man-made QRM from power lines, television sets and other appliances, spending an idyllic weekend DXing in an electrically quiet location, is something an avid DXer should dream about. When one is organised, you would think that DXers would jump at the chance, but this sadly is not the case. I hope that those who organise such outings will persevere in spite of the apathy.

One last item; it was reported in the May magazine and also on the Federal Tape segments of the Divisional Broadcasts, that GMT was no more. Such is not the case, for the BBC came to the rescue of the Royal Greenwich Observatory, giving them finance to continue the Casurium clocks. This will allow the famous Greenwich time *pips* to be heard on the hour.

Well, that is all for this month. Until next time, the very best of listening and 73 — Robin VK7RH.

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How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

The words in a letter I recently received from a regular reader of the column set me thinking. It in part read . . . "I am not an intrepid DXer, (I get scared when I am working a pile up and make mistakes . . ." My answer is — so what!

Our hobby is just that; a hobby, not a business, everyone is human and are liable to make mistakes or errors of judgment — most amateurs are tolerant people and remember they had to make that initial QSO when they received their licence.

I admit that when I received my LAOCP, it took me hours to come to terms with the microphone and eventually call CQ. My first QSO on 'home brew' six metre equipment, luckily was with Rex VK3VL, who had talked me into sitting for the licence when we were working together in a country town, so many years ago that I wish to forget.

Unfortunately, my second encounter was not so pleasant and a 'perfectionist' gave me a rough time. In time, I probably had more QSOs (some of very long duration) with this amateur than any other. I think I learned a lot from his philosophy.

On gaining my AOCP, I decided that DX from my initial CQ, was my ambition. I have mixed it with many operators from many countries and have found that tolerance and persistence has paid off. I have made many mistakes but I hope that I have learned by them. Only my fellow hobbyists can judge.

Ladies and gentlemen, call CQ DX, get in amongst the 'dog-piles' for that rare DX station and experience will be your best teacher.

Remember, the bands need you — a licenced amateur!

QSL MANAGER

A note from Joanie KA6V, advises that she is now QSL Manager for Ed, ex KB6DAW/KH2 and later AH2BE. Ed, whilst on holidays in June, used the call 8P6GI and about the middle of next month he will be residential in Korea for 12 months using an HL9 call, which is still to be allocated.

Joanie is also the Manager for Joe KC6HA, located in the West Carolines and ON4ABT who works mainly 40 metre DX.

QSLing seems to be a family affair as Joanie's husband, Jerry AA6BB, is doing the chores for Willie T30AC, who is located on West Kiribati.

This happy duo's QTH is 93787 Dorsey Lane, Junction City, Oregon, 97448 USA.

FO0XX

The operators left Clipperton on the 11th May, after making in excess of 15 000 contacts. The band breakdown was 10m-1520; 15m-3512; 20m-5953; 30m-23; 40m-3653; 80m-1074 and on 160m they had 79 entered in the log book.

Congratulation to the operators on a fine four day effort.

LONG WIRES

A note from Gil VK3CGG, with some information for the column notes that he uses an IC-720A fed into a 'home brew' tuner with a vertical, dipoles and long wire antennas at his disposal. Of the long wires, one at 75 metres and the other at 450 metres in length, Gil finds the 75 metre piece of wire superior to the other immense length of radiating wire by about 3 to 5 dB.

Unfortunately, Gil must be adjacent to some main power lines as he finds that sometimes on 160 metres the QRN can reach S9+10 dB, which is not conducive to working rare DX.

Gil starts on QRP and gradually builds up power. He has never as yet called CQ DX but has quite a few countries to his credit on the CW mode considering the short time he has been operating, including a number on 10.103 MHz.

My hat is 'dipped' to you for your persistence Gil and get that 450 metre length of radiator 'purring.' It will pay dividends I feel sure.

DON'T THROW THAT CARD AWAY — YET!

Have you worked 4U1VIC? Have you received their magnificent cards? If you have, hold it in the family safe, as it may still become a new DXCC Country.

Selim OE6EEG, is still trying to gain DXCC status for 4U1VIC and it appears that if it is not granted, the status of 4U1ITU, 4U1UN and 1A0KM could be in jeopardy.

The controversy is all centred around the changing of Rule 5(b) of the ARRL DXCC Criteria and my personal opinion is that it should never have been altered or alternatively, when it was altered, 4U1ITU, 4U1UN and 1A0KM should have been deleted from the list there and then.

More headaches for Don Search, the programs administrator and associated committees.

To all concerned please look at it again and make it fair to all who meet the criteria of 'yesterday and today'.

YASME — THE HISTORY

During 1954, a British subject, Danny Weil, built a yacht and named it *Yasme,* using a Japanese word that means *'good luck'*.

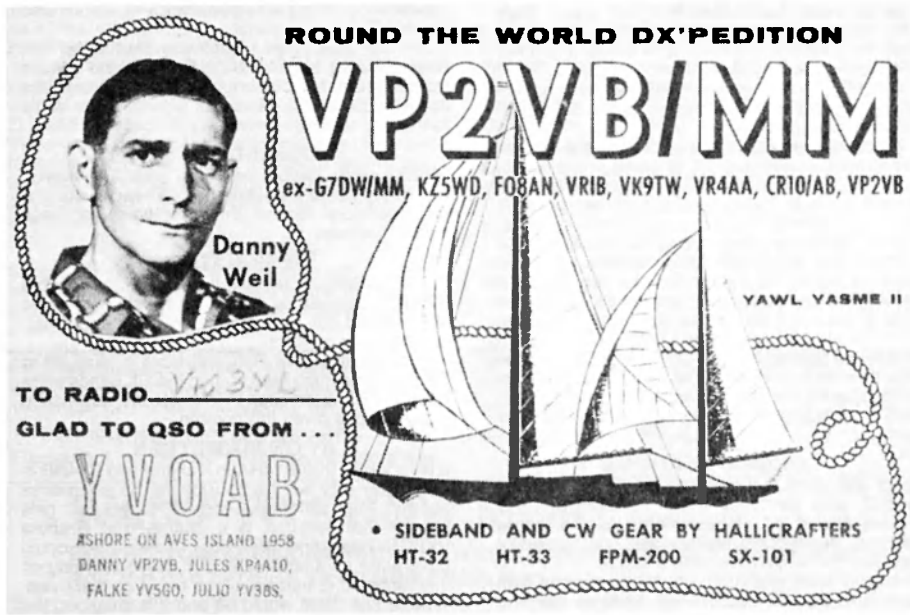
Danny had never sailed a boat before and he was not an amateur operator but he was determined to sail around the world. Despite the many difficulties encountered, he managed to sail the *Yasme* from England to the British Virgin Islands where he fortunately met up with the late Dick KV4AA.

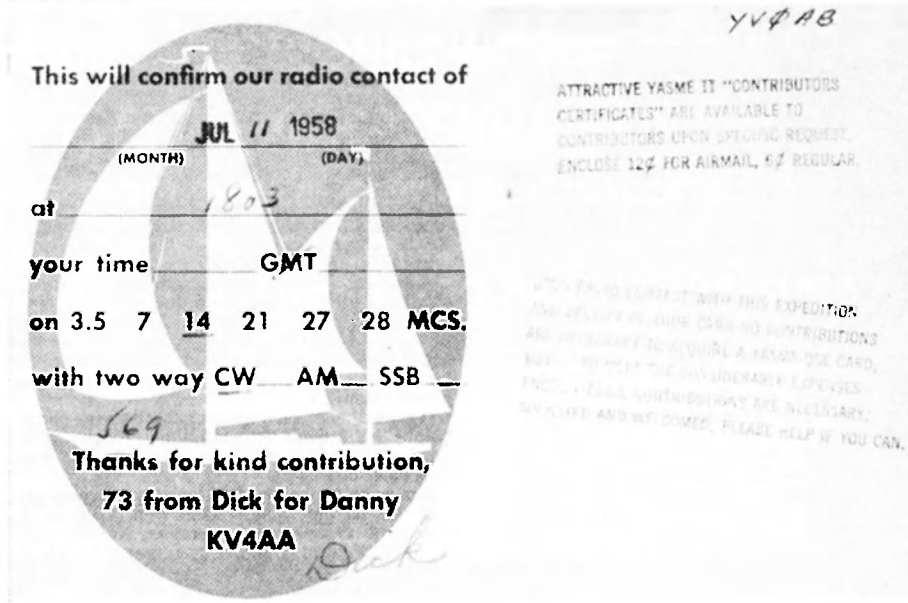
Dick, in his persuasive manner for which he was renowned and also being renowned for being one of the best DX operators known to our hobby, persuaded Danny to become an amateur before continuing his trip.

Danny hence forth took up another challenge, gained an Amateurs Operating Certificate of Proficiency and within hours was working DX at 20 words per minute. No mean feat.

He installed a rig aboard his home made vessel and continued his trip calling it the *Yasme DXpedition.*

The *Yasme Foundation* was formed during 1961 to help Danny meet expenses.





Danny married in 1964, and his wife accompanied him on several trips before they settled ashore.

Since 1965, the Yasme Foundation has sponsored the DXpeditions of Iris W6QL, and Lloyd W6KG, two of the worlds most competent ambassadors for our hobby. Iris and Lloyd pay all their own expenses which will be quite an eye-opener to a number of DXers. They are true-blue DXers.

The Yasme Foundation handle QSL cards and DXpedition publicity only.

It is refreshing to see that a non-profit organisation still exists in our amateur hobby.

Iris and Lloyd have gone to 'unknown' areas to give DXers another country and they are 'tops' in my book of the greats.

PROFILE — THE COLVINS

Lloyd W6KG, and Iris W6QL have been licensed between them nearly 100 years. A lot of experience. Their daughter Joy, is also an amateur of long standing.

Many amateurs feel, (and rightly so) that DXCC is an achievement. Such amateurs have just reason to be proud and to be able to reflect back on their achievement, as DXCC is not that easy to achieve.

The Colvins, or the 'Globe-trotting Colvins' as I refer to them, have achieved this award from using the call sign from 100 countries. No mean effort for a couple that hold more DXCC and other certificates than anyone else in the world.

This couple have made over one million contacts from 166 countries and have used 120 different call signs.

Their received QSLs are said to be the largest alphabetically recorded set of cards in the world, numbering in excess of half a million. I am proud to have cards in that collection and their cards in return . . . VK3AH.

Both licensees hold Extra Class FCC/USA licenses and Five Band DXCC awards and have been on the DXCC Honor Roll for more than a decade, no mean feat. Before being under the YASME banner both had world wide recognition from the end of WWII, when Lloyd spent 20 years in the US Army Signal Corps on world wide assignments that allowed the duo to operate from many unusual and wanted locations. Congratulations to a dedicated duo that are a credit to the hobby!

CONGRATULATIONS

Again the word congratulations go to Heather VK2HD, who has been made a Director of the YASME Board of Management. At the same meeting, the late Don Wallace was posthumously awarded the KV4AA Memorial Plaque.

Heather is an avid DXer, when time permits, and I am sure that all readers will endorse me and other DXers in wishing her well in another role of our hobby.

OPERATION FROM ZL

ZL0ABQ operated from ZL and contacted quite a few VKs, the QSL address is AA7T via the bureau or the Willamette Valley DX Club, PO Box 555, Portland, OR 97207, USA.

NEW HELP

Don Search has help now with DXCC applications. The successful applicant was AH2W. Congratulations to the new appointee and also to Don for the marvellous job they do and to some of the decisions that they have to make. Not an envious position at anytime.

HEARD BUT NOT WORKED

Jim VK3YJ, evidently not being able to sleep after his return from holidays in Europe, was listening in the early hours of the morning of the 15th May, on the 20 metre band and came across SM5BFC running a list for 5A1AD. Jim heard the station at strength 5x1, calling himself Ahmed and to QSL to a Tripoli address.

Whether he was in the allocated country and whether he has the required documentation, I would treat as being rather suspicious, particularly in the present climate in that area. The operator was giving 5x9 to a bevy of Europeans who were lapping the "new country" up.

The adage still goes — work them first and worry later!

WALVIS BAY

According to Bob W5KNE, Walvis Bay is a DXCC anomaly. He has seen a letter from the ARRL DXCC desk that clearly stated that a contact with Walvis Bay, an enclave of South Africa, does not count for anything . . . not as a separate country, not as Namibia, and not as South Africa. As far as the DXCC award is concerned as, in their eyes, Walvis Bay does not exist, but Tom ZS6USA, is considering an operation from the area. Another case of work and wait I imagine.

ACCEPTABLE CARDS

The ARRL DXCC Desk has received documentation from N7DF/TT8, which is deemed as acceptable. Other documentation has been received from Frank DL7FT/SV/A, which has to be translated from Greek to English and checked. I hope it is a 'good one'. Cross fingers folks but in my opinion , don't hold your breath.

Incidentally, VO1OC, claims to have "a good set of documents". Again it Is a case of wait and see.

SILENT KEYS

It is sad to report that Soupy W5NW, who was well known to many VK operators is a silent key. I personally have had the pleasure of many memorable QSOs with this gentleman and discussions with his strong affiliation with the ARRL. Sincere condolences to his wife Beth W5DUR, who is also an avid DXer.

Another well known identity in Bart WB6FBN, passed away on 2nd May. Bart will be always remembered for his bright personality and his activities as a QSL Manager. Condolences to his family.

DON'T DESPAIR

BV0BG cards should be in the mail. The holdup has been due to a printing problem in Taiwan and the operators extend their apologies to those awaiting a card.

RESIGNATION

Ron ZL1AMM, Is resigning as DX Editor for the NZART's magazine *Break In,* which he has so ably carried out, with severe difficulties at times, for a number of years.

Your replacement Ron, will have a hard act to follow, but we may hear you on the DX bands more frequently and sincere thanks for the assistance that you have given this column.

BY ON SIX METRES

It is reported that BY4RA in Nanjing and BY4RB in Zhenjiang City will be operational on six metres shortly. This will make the VK boys and girls keener than ever. It is a shame that Graham VK8GB, has gone QRT from Darwin as it could have been another first for him. Keep listening on this fascinating band and you could be rewarded. What a pile there would be and it is imagined the telephone lines will be running 'hot' if and when there is an opening!

ANOTHER PREFIX

The 7S prefix belongs to Sweden's Frivilliga Radioorganisationen (FRO) which is a voluntary radio organisation that could be likened to WICEN, who are celebrating their 40th anniversary. If you missed, 7S1FRO will be active between the 2nd and 10th of next month.

STILL AWAITING A CE0AA CARD?

It appears that Tex N6AHV and his wife Opal KE6IS are helping sort out the missing and unreceived precious CE0AA card mess.

If you are missing a card from this operation, there is still hope. The above duo are documenting the required cards and transferring the information to Mickey CE3ESS, who In turn checks the log, if correct, raises a card and forwards them in bulk to Tex and Opal, who sort them out and forward them on.

It is worth a try as it will probably be a long time before this area is actuated again. Please send adequate funds to cover the inconvenience and expensive operation.

It is a shame that the QSLing went 'haywire' on this one as the Chilean Club went to a lot of trouble to organise the operation. No one can actually pin-point what did go wrong but a lot of VKs did not receive all the cards if any of what they worked and sought.

BITS AND PIECES

Look for FO0ASJ, who will be QRV until the 10th of this month. * * Don K7ZZ, is again QRV as CT4AT. Included is a two element 80 metre Yagi in the antenna array. Listen for that big signal. * * Scan the bands for VE7AGC signing ZF8 and ZF9 anytime. * * KE3A is no longer the QSL Manager for 6Y5IC. * * ON6AF/A was a special call for a station operating from the Beauvechain Air Force Base. * * ON7IP/ST2 will be active until the end of this month. * * Lamar T32AB is QRV on 24 MHz.

* * QSL Manager KA1XN has received the logs from P43A and now faces the task of sorting many kilograms of cards. No mean task! * * Milan OK1AWZ, well known to many VKs has been working in Vietnam for several months and as of yet has been unable to obtain a licence. * * 4N7 is a permanent alternative prefix for Yugoslavia. * * Don't count on 4W, 5A or 7O to appear as legitimate operations for many a-year. * * LY4L activated to commemorate Lenin's birthday. * * N7DF/TT8 is now acceptable for DXCC. * * 5H3ED is operational and the QSL Manager is I4FGG. * * VQ9s QM and RB have gone QRT from Diego Garcia. * * Congratulations to King Hussein JY1, who became a father again recently. Incidentally he has been active on the bands of late. * * A reciprocal agreement between Japan and West Germany became effective on the 1st of May. * * WWV has had intermittent trouble of producing the predictions at 18 minutes past the hour over the last few weeks. */* A new YL operator has been heard from BY4AA. * * FW4AF left Wallis Island towards the end of March.

HEARD AND WORKED ON THE EAST COAST

28 MHz

YB0JH, YC0BRX*, YC0EZF, YC0HOB

21 MHz

5W1CW*

14 MHz

3A2LF, 4N7ZZ, 5A1AD, 5B4JB, 6Y5MS, 9M2MM, AH6GQ, BY5RF, CN2AQ, EA4CB, G3LPA, IK1PGS, JA4FQA, JT5AA, OE1PC, OH1HU, OH2BOZ, ON1TR, ON1BTE, PA3DLO, PA3EFB, SM2DXC, SP5SS, SP9EG, SP9EM, SP9MQ, TI2ANL, T32AN, UG6GAT, VK0SJ, UQ1QRZ, YO2BVS, YO9AWW, Y24KRB, Y75SN

10 MHz

G2BY, G4FM, K4AWY, W0AOA, W2GW

7MHz

EA7AIN, CO7GC, HK6GEA, XE2AHQ

*Note: * denotes CW operation.*

QSL TO:

3D2GB:W2GBX; 3G4A:CE4BQO; 3G4B:CE4ETZ; 3X0XSH:DK8PR; 4K1C:UA4HCS; 5T5SR:N4GNR; 5W1DZ:WB2LVB, 5Z4DE W4PKM; 6F1JCL:XE1JCL; 616XF:XE1XF; 7J3AAB:JM3LYS; 7J3AAC:W1YY; 8P9AR:N6AUV; 8P9GI:KA6V; 9X5DH:DK6EA; A35NK:K8KEW; AH2BE:KA6V; AH3AC/TF:KB2RV; AZ1ARU:LU4AA; AZ1ARU/5:LU6FAZ; AZ1ARU/8:LU4HH; AZ6ETB:LU6ETB; AZ8DQ:LU8DQ; C31LBL:EA3DDP; C56/EA5AL:EA5EBX; CP8/DL3NAZ; CQ0NH:CT4NH; CQ8UA:W3HNK; CR8CDL:CT1DL; CX5RV:G5RV; DX9C:DU9RG; EK1P:UP2BBM; EK9AD:UZ9CWW; EM2C:UC1AWB; EM4AAW;UZ4AZM; EM7BRN:UB4RWW; EM8CIL:UC1IWF; EM9BWL:UB4WWA; EO0AAK:UZ0AWA; EO1AAK:UZ1AXN; EO1ACL:UZ1AXH; EO1AQW:UZ1QWA; EO2QGL:UQ1GWF; EO3ALE:UZ3LWN; EO4AHK:UZ4HWA; EO7L:UL8GWB; ER3A:UZ3AZO; EU2C:UC1AWR; EU8I:UI9AWA; EV4AW:UA4WE; EV9AW:UW9WR; EV9AX:UZ9XWA; EW0CL:UC9LWA; EW1AA:UZ1AWA; EW3AK:UZ3AZM; EW6AA:UV9AM; EW8TJ:UT4JWA; FO0WVR:N6VR; H44JA:JR6CMA; H5AY:ZS4NS; HB0CBJ:DJ1BP; HG7B:HA7KSR; HG9R:HA9PP; HI0JR:HI3JR; HL1AQ:JA2AUI; HPXHY:JA1LW; HS3ED:I4FGG; HS4AMS:W7PHO; J73D:W2OB; J73LC:KF4IL; JW5E:LA5NM; JY8KV:SM0KV; JY8XY:WB9YXY; KA2ATM/TF:KA2ATM; KB1HM/KJ6:KB1HM; KB6DAW KH2:KA6V; KC2TU/TF:K2SDD; KC6HA:KA6V; KX6AX:KX6BU; L4D:LU4DCK; L4H:LU7HJM; L8H:LU4HH; LG5LG:LA2ZN; LY4L:UA4LM; LZ7A:LZ2KTS; N4MJH/4X:AC3A; N6EK/C6A:N8EK; N6EK/VP5:N6EK: OE5JTL/YK:OE5BA; ON7IP/ST2:ON7IP; ON4ABT:KA6V; RT0U:UT4UWV; SJ9WL:SM4FTF; SV0EK:N1DSC; T30AC:AA6BB; UV1OO:UA9LBR; VK0SJ:VK7RM; YT2AA:YU2SEV; ZC4CZ:G4MCO; ZF1MM:VE5RA; ZF2HW:WA9AQN; ZK1CY:W8KNH; ZL7AA:ZL1AMO.

QTHS YOU MAY NEED

8R1AMO	PO Box 1086, Georgetown, Guyana.
9L1IS	PO Box 1289, Freetown, Sierra Leone.
BY5RF	PO Box 209, Fuzhou, PDRC.
CP9JX	PO Box 82, Santa Cruz, Bolivia.
GW4KYN	Gwyn Morgan, PMB 2199, Jos, Nigeria.
HK6GEA	PO Box 1191, Manisales, Colombia.

HL9CW	K Silverman, APO San Francisco, CA 96301, USA.
HL9OB	PO Box 277, APO, San Francisco, CA 96366, USA.
J28DN	PO Box 1724, Djibouti, Djibouti.
J28EG	PO Box 2417, Djibouti, Djibouti.
T32AN	PO Box 17788, Honolulu, 96817, USA.
TI8CBT	PO Box 119, Punta Renas, Costa Rica.
XO5BIB	PO Box 134, Santiago, Chile.
HH9E	PO Box 243, Fort Liberty, Haiti.
HI80RCD	PO Box 1157, Santo Domingo, Dominican Republic.
ZK1DD	PO Box 10, Aitutaki, Cook Islands, South Pacific.
ZK2JB	PO Box 181, Niue Island, South Pacific.
ZL8OY	Mrs Kay Hannagan, The Terrace, Warrington, Otago, New Zealand.

In closing two quotes from KH6BZF Reports *"In propagation . . . expect the unexpected and the expected as well . . ."* and *. . ."If you are not the lead dog on a dog sled team . . . then your scenery never changes . . ."* Lee, how do you think them up?

THANKS

Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-OSO, DX FAMILY FOUNDATION NEWSLETTER, INSIDE DX, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, PAPAKURA RADIO CLUB BULLETIN, QRZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, cqDX, DX POST, JA CO, JARL NEWS, KARL NEWS, QST, RADCOM, VERON and WORLDRADIO.

Members who have contributed include VKs 2PS, EBX, 3YJ, YL, CGG. Overseas amateurs include AA7T, KA6V, W6SZN and ZLs 1AMM and AMN. Thanks to one and all who have made the column possible this month.

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FORBIDDEN TELECOMMUNICATIONS

The following countries have notified the International Telecommunications Union that they forbid telecommunications with amateurs under their jurisdiction:

Angola; Burma; Ethiopia; Ghana; Iraq; Libya; Pakistan; Saudi Arabia; Somali; Thailand; Turkey; Yemen and Zaire.

A side note on Turkey: there are Turkish amateurs and they are active. The Turkish Amateur Radio Society has been in correspondence with CRRL.

From *CRRL News*, 30th March 1966.

THIRD-PARTY

Canada has third-party traffic agreements with the following countries: *Antigua and Barbuda; Australia: Bolivia; Chile; Colombia; Costa Rica; Dominica; Dominican Republic; El Salvador; Grenada; Guatemala; Guyana; Haiti; Honduras; Israel; Jamaica; Mexico; Nicaragua; Paraguay; Peru; Trinidad and Tobago; United Kingdom (certain special-event stations only); United States; Uruguay and Venezuela.*

From *CRRL News*, 30th March 1986

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

It is always nice to be able to say *thank you* to those who have helped out in the never-ending task of trying to preserve our space on the amateur bands. Those who helped in March 1986, were:

VKs 2BQS; 2PS; 2QL; Mr G H A Bradford; 3AMD; 3LC; 3XB; 3XU; 4AFA; AKX; 4AV; 4BG; 4BHJ; 4BMD; 4BTW; 4KHZ; 5BJF; 5GZ; 6CX; 6JQ; 6RO; 6XV; 6XZ; 6YS; 7DO; 7NBF; 7RH; 8HA and 8JF.

STATISTICS

Statistics for the month were:

Broadcast Mode	*381*
CW Mode	*166*
RTTY	*205*
Other Modes	*115*
Intruders who gave identifying call signs	*82*

JAMMING

There is still great evidence of jamming stations on 40 metres, which are more of a curse than the intruders they are jamming.

Sadly, there is some mis-guided person also causing deliberate interference on 7.085 MHz to the 40 metre DX Net which is conducted by Eric ZL2AAG. Perhaps the nuisance operator is one of those un-informed people who consider that a net takes up more space on a frequency than a two-way QSO. Anyway, reports have gone to the DOC in VK2 and VK4, and we may be able to get rid of this nuisance.

SPECIAL THANKS

Special thanks go to Roy VK6XV, for extra special help given in March 1986. As a matter of fact, the reports from VK6 were generally excellent for that month — *keep up the good work!*

In the column for January 1986, I mentioned that Peter Boskos, a former SWL has upgraded to VK2KPI — Peter now heads his reports with the call VK2EHQ — *well done again, Peter!*

SHORTED COAX AWARD

It looks as if the *Shorted Coax Award* (if there was such a thing) would have to be presented co-jointly to Radio Tirana (Albania) and Radio Beijing (Peoples' Republic of China, and formerly Radio Peking) for their continuing presence on 40 metres, to the detriment of all authorised users of the band, and for stubborn refusal to fit in with **responsible** users of the radio frequency spectrum. These two share the dubious honour of being the two most persistent and irritating intruders using the broadcast mode.

TAXI CAB

There is still nothing definite on the alleged taxi-type operation on the bottom of 28 MHz in the Asian languages. I suppose everyone will start to scream when the band opens into Cycle 22, and by then, of course, it may well be too late. Have a listen and see if you can hear the activity. But *do not forget* to let the IW know if you do hear it!

REMINDER!

I have asked the DOC if they would remind the USSR authorities of their promise to have the intruder *UMS* removed from the 15 and 20 metre bands. The USSR promised, in February 1985, to do this. We are still waiting. Letters from Ulrich DJ9KR, of the DARC Bandwacht, and Joeke PA0VDV, the IARU Region 1 Monitoring System Co-ordinator, show that they are hearing a lot of the same intruders in their areas, as we are.

Fortunately for us, however, they are also hearing a lot of intruders that we cannot hear.

Col VK4AKX, points out that 10 years ago, there were many intruders on the 80 metre band which are no longer present. Many of these are still present on other bands, originating from the same countries. The significant addition in 1986, is the presence of jamming stations, which are often up to eight kilohertz wide. This does not make for easy listening.

Well, that is all for this month . . . please keep the Intruder Watch in mind while you are on the air, and I wish you 73 and good DX.

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WANT TO KNOW MORE?

Contact your Divisional Intruder Watch Co-ordinator to find out how you too can become an Intruder Watcher!

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER

56 Baden Powell Drive, Frankston, Vic. 3199

AOCP THEORY EXAMINATION TEST PAPER

Following is a Sample AOCP Theory Examination Paper. Select the correct or most appropriate alternative answer.

1. Mutual Inductance:

a. *occurs only with helically wound coils.*
b. *occurs when a constant current is flowing.*
c. *requires two coils in the same magnetic field.*
d. *can only occur with sine wave AC.*

2. All microphones operate by:

a. *using a diaphragm to move a coil.*
b. *changing audio frequencies to radio frequencies.*
c. *causing sound waves to vary the voltage across a crystal.*
d. *converting sound wave energy to changes in electrical energy.*

3. The terminal voltage of a car battery increases above 12 volts when the alternator is charging. The power output of a solid state FM transceiver drawing its primary power from this battery will:

a. *increase when the voltage increases.*
b. *not change.*
c. *decrease with increased engine speed.*
d. *depend on the degree of voltage regulation in the transceiver low level stages.*

4. Frequency dependent interference to radio reception may be reduced by:

a. *RF bypassing speaker leads.*
b. *RF bypassing the AC input power supply lead.*
c. *using a stub filter.*
d. *radiation into the power mains.*

5. Variations in HF propagation during a 27 day cycle are probably due to the:

a. *phase of the moon.*
b. *solar sunspot cycle.*
c. *rotation of the sun.*
d. *inclination of the earth.*

6. A practical direct conversion receiver would usually:

a. *include a low pass filter after the mixer.*
b. *have two IF stages.*
c. *function without a local oscillator.*
d. *have AGC on the IF stage only.*

7. A FET is preferred to a bipolar transistor when used as an HF or VHF RF amplifier because:

a. *it has a lower Q and is more selective.*
b. *it is less subject to overloading from strong signals.*
c. *the tuning circuits are easier to adjust.*
d. *less capacitance and inductance is required to cover all bands.*

8. Intermodulation interference is generally caused when:

a. *a transmitter radiates spurious frequencies.*
b. *non-linear stages generate unwanted frequency products.*
c. *stray capacitances and inductances act as tuned circuits.*
d. *harmonics of the oscillator stage fall outside the amateur bands.*

9. Slow Scan television (SSTV) is:

a. *not used at HF*
b. *best suited to subjects in rapid motion.*
c. *only useful for short range because of phase distortion.*
d. *not suitable for reception on a domestic television receiver.*

10. The purpose of 'doping' semi-conductor material is to:

a. *increase the heat tolerance.*
b. *allow growth of large crystals.*
c. *cancel out natural impurities.*
d. *provide current carriers.*

11. If a receiver frequency readout is displayed in discrete steps it is termed:

a. *analogue.*
b. *digital.*
c. *incremental.*
d. *proportional.*

12. In AC wave-form, the RMS value is:

a. *twice the peak voltage.*
b. *.707 of the peak voltage.*
c. *half the peak voltage.*
d. *equal to the peak voltage.*

13. Secondary emission from the anode of a vacuum tube is prevented by:

a. *the suppressor grid.*
b. *the screen grid.*
c. *internal coupling of the screen grid to the control grid.*
d. *operating the tube as a Class C amplifier.*

14. In a reactance modulator, FM may be achieved by applying the audio signal in a manner to vary:

a. *L only*
b. *C only*
c. *either L or C.*
d. *L and C simultaneously in opposite polarities.*

15. The voltage and current distribution along an antenna is in part determined by the fact that:

a. *there can be no current flow at the ends.*
b. *the centre is always a current maximum.*
c. *the voltage at the ends must be zero.*
d. *current and voltage are always in phase.*

16. In multi-hop HF transmission:

a. *the signal may change frequency due to the earth's rotation.*
b. *signal polarisation may change.*
c. *attenuation occurs at each refraction but not at the reflections.*
d. *frequencies above the MUF should be used.*

17. A cathode ray oscilloscope pattern is controlled by:

a. *the temperature of the cathode.*
b. *the setting of the trigger control.*
c. *voltages applied to the deflection plates.*
d. *the bias setting of the sweep generator.*

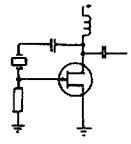
18. For personal safety reasons it is important to realise that large value electrolytic capacitors used in a circuit without a 'bleeder' may:

a. *remain charged forever.*
b. *not be charged again.*
c. *become reverse polarised.*
d. *remain charged for several days.*

19. A 100 watt output transmitter contains a harmonic at a level of 60 dB below the carrier. The power of this harmonic component is:

a. *0.1 watt.*
b. *10 milli-watts.*
c. *0.1 milli-watts.*
d. *10 micro-watts.*

20. This circuit represents a:



a. *Pierce crystal oscillator.*
b. *Colpitts crystal oscillator.*
c. *crystal oscillator with frequency multiplier.*
d. *VXO.*

21. An artificial antenna should:

a. *have twice the input impedance of the normal antenna.*
b. *be inside the transmitter case to prevent unwanted radiation.*
c. *have the same input impedance as the transmitter output impedance.*
d. *use inductive resistors.*

22. Ground wave propagation at HF is:

a. *unaffected by soil conditions.*
b. *greatest at 28 MHz.*
c. *least with vertical polarisation.*
d. *frequency dependent.*

23. Severe interference to television reception on all channels is probably due to:

a. *amateur station harmonics.*
b. *direct overload from a nearby amateur station.*
c. *power line leakage.*
d. *the lack of a low pass filter at the receiver input.*

24. Leakage current in semi-conductor devices is possible because of:

a. *thermally generated current carriers.*
b. *sensitivity to light.*
c. *naturally occurring impurities in the material.*
d. *the density of the atoms.*

25. A capacitor which is an integral part of an IC chip:

a. *is a passive component.*
b. *is an active component.*
c. *will have a very high working voltage.*
d. *usually has an air dielectric.*

26. An advantage of using a Five-Eighth wave length vertical antenna is that:

a. *it is physically shorter than a half wavelength.*
b. *the length provides a 50 ohm base impedance.*
c. *the angle of radiation is low.*
d. *it is effective as a multi-band radiator.*

27. In a balanced transmission line:

a. *the SWR will always be less than 2.5:1.*
b. *both wires are at equal potential to earth.*
c. *the velocity factor is about 0.66.*
d. *the impedance depends on the voltage applied.*

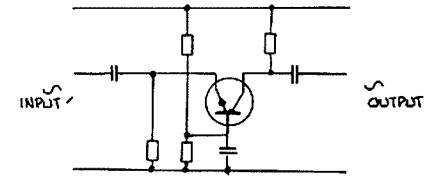
28. A slow change in an oscillator frequency after switching on may be due to:

a. *a capacitor charging effect.*
b. *a change in the Q of the tuned circuits.*
c. *a sensitivity to temperature changes.*
d. *rapid HT voltage changes.*

29. The effective advantage gain of a Single Sideband Suppressed Carrier over Amplitude Modulated emission (of the same power output) is approximately:

a. *2 dB.*
b. *3 dB.*
c. *6 dB.*
d. *9-12 dB.*

30. This transistor configuration:

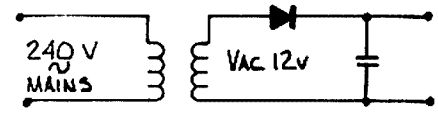


a. *could be used as a frequency multiplier for VHF*
b. *has a high current gain.*
c. *is a common emitter.*
d. *has a 180 degrees phase shift.*

31. The frequency of a Quartz crystal:

a. *is permanently fixed at the time of cutting.*
b. *can be varied slightly in an oscillator circuit by using a trimmer capacitor.*
c. *can be varied by about 20 percent of its marked frequency*
d. *increases when mounted.*

32. If VAC=12 volts RMS, the PIV rating of the diode should be at least:

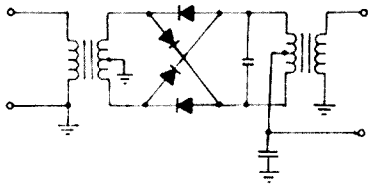


a. 50 volts.
b. 30 volts.
c. 20 volts.
d. 12 volts.

33. Spurious emissions at VHF emanating from an HF transmitter may be prevented by using:

a. a high pass filter at the transmitter output.
b. a resonant antenna.
c. a linear final amplifier.
d. ferrite beads in all active leads in the final stage.

34. This circuit represents:



a. A balanced modulator.
b. a bridge rectifier power supply.
c. an RF attenuator.
d. an FM discriminator.

35. An amplifier operating in class A:

a. is biased to cut off.
b. has a power efficiency of about 70 percent.
c. is linear.
d. can only be used for audio frequencies.

36. The loading effect of a moving coil meter is:

a. only significant when it is used as an ammeter.
b. rated in volts per ohm.
c. dependent on the internal resistance of the meter.
d. greater at AC voltages than DC voltages.

37. Ionisation of the upper atmosphere layers is caused by:

a. the magnetic field of the earth.
b. the ozone layer.
c. solar radiation.
d. night to day time temperature variations.

38. A two-metre FM signal achieves full receiver quieting, but produces low audio output. It is likely that the transmitter has low:

a. audio gain after the phase modulator.
b. RF output.
c. discriminator output.
d. deviation.

39. The Q of a series resonant circuit:

a. is an indication of its mechanical stability.
b. increases as the applied voltage increases.
c. can be calculated from the frequency and inductance values.
d. can be calculated from reactance and series resistance.

40. A metal water pipe when used as a common earth return may become 'live' if it:

a. has a high resistance path to earth.
b. is near the mains earth.
c. is a large diameter copper pipe.
d. is buried deep in wet soil.

41. External cross-modulation may occur when:

a. a low pass filter is fitted to the receiver.
b. a corroded metal joint acts as a rectifier of RF energy.
c. two signals separated by only a few kHz, are received together.
d. omni-directional microphones are used.

42. Band pass crystal filters:

a. cannot be used at frequencies above 500 kHz.
b. generally lack Q.
c. have a low impedance at the design frequency.
d. are used in series to reduce overall resistance.

43. If the frequency applied to a capacitor is doubled, the reactance is:

a. unchanged.
b. halved.
c. doubled.
d. squared.

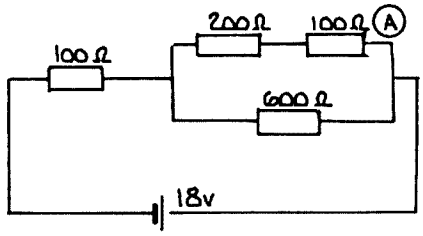
44. Noise limiters are generally most effective against:

a. continuous single frequency carriers.
b. short duration pulses.
c. noise generated in RF stages.
d. over-modulation and cross-modulation.

45. One Farad is equal to:

a. 10^9 nanofarads.
b. 10^6 picofarads.
c. 10^9 microfarads.
d. 10^3 megafarads.

46. In this circuit, the current flowing at point A will be:



a. 0.018 amp.
b. the same as at B.
c. the same as at C.
d. 40 milliamps.

47. Many modern amateur stations incorporate a digital frequency meter which:

a. works by heterodyning with a highly accurate VFO.
b. may achieve an accuracy of better than 0.001 Hz.
c. can only be used above 20 MHz.
d. is only as accurate as the crystal reference oscillator.

48. A key click filter used in a CW transmitter:

a. is only necessary when the key is in an active RF lead.
b. stops the radiation of unwanted harmonics.
c. shapes the leading and trailing edges of each pulse.
d. is used to give a clean sharp make and break.

49. A frequency transverter:

a. allows an HF transceiver to be used on VHF
b. translates an analogue output to a digital readout.
c. can only process AM signals.
d. allows FM to be received on an AM receiver.

50. A detector which is suitable for CW, AM and SSB is the:

a. simple diode detector.
b. discriminator.
c. ratio detector.
d. product detector.

ANSWERS TO AOCP SAMPLE EXAMINATION PAPER.

1. c	11. b	21. c	31. b	41. b
2. d	12. b	22. d	32. a	42. c
3. a	12. a	23. b	33. d	43. b
4. c	14. c	24. a	34. a	44. b
5. c	15. a	25. a	35. c	45. a
6. a	16. b	26. c	36. c	46. a
7. b	17. c	27. b	37. c	47. d
8. b	18. d	28. c	38. d	48. c
9. d	19. c	29. d	39. d	49. a
10. d	20. a	30. a	40. a	50. d

PCB MAKING MADE EASIER?

A company in New York, USA, has invented, and is now marketing Image Film that will simplify making PCBs.

Firstly, the required circuit pattern is photocopied *direct* from any magazine or book onto TEC-200 film by using any standard plain paper copier using toner. The high heat resistance of the film and the quality of modern copiers ensure a perfect copy.

Next, the copied circuit diagram is transferred to a piece of copper-clad PC board using a hot iron. The toner on the film will melt and will form a varnish like, acid proof, etch resist coating.

Remove the film from the board and the board is ready for etching.

From *QRM*, March/April 1986

WICEN News

Ron Henderson VK1RH
171 Kingsford Smith Drive, Melba, ACT. 2615

HF EMERGENCY PROCEDURE

At the IARU Region 3 Conference, held in Auckland during November 1985, the following motion, put forward by IARU Region 1, was adopted unanimously.

"The IARU Region 1 Division HF Working Group
Recognising — that a common emergency procedure for all Regions on HF is desirable
Proposes — that the IARU Region 3 Association adopts in principle the Region 1 HF Emergency Procedure as adopted by the IARU Region 1 Conference in Cefalu (see annex).

The Conference inserted *in principle* into the proposal for Regional Societies recognised that actual procedures were often dictated by the SES/ Civil Defence organisation the amateur society was affiliated with. Indeed we in WICEN generally follow the procedure in the SES (formerly Civil Defence) *little grey book* and *NZART AREC* would support the proposal only as far as paragraph 4.

Never-the-less, for those Member Societies of Region 3 who have no experience the HF Emergency Procedure provides useful guidelines to emergency operations.

The Procedure is reproduced in full below for the information of Australian amateurs, taking note of the reservations identified above.

HF INTERNATIONAL EMERGENCY OPERATING PROCEDURE

1. General — Amateur radio is one of the Radio communication services set up by the International Telecommunication Union. In all these services emergency traffic has absolute priority over their normal operation.

Emergency operation requires an efficient forwarding of traffic. Efficiency of communication Is not self-evident in amateur radio so each operator has to think about how he should react in case of emergency and should obtain as much preparedness as possible.

2. Measures in case of emergency —

— if you hear the word "emergency", "welfare-traffic" or the abbreviation QUF — stop transmitting and listen.

— if you receive such traffic — stand by, observe it and write down all you hear.

— do not leave the frequency before you are sure that you cannot help and somebody is helping.

— do not transmit before you are sure that you can help.

— follow the instructions that traffic controlling station (if there is one) is giving you. The traffic is controlled by the station in emergency or the station appointed by the station in emergency.

— keep messages short — do not transmit useless information.

— in case of Interference by other stations, the traffic controlling station or other stations appointed by it should transmit the word "emergency", "welfare-traffic" — "stop sending" or the abbreviation QUF to the interfering station.

— gather information by following system

When?	(date; time; frequency)
Where?	(emergency place)
What?	(what happened? what is to be done?)
How?	(how can be helped?)
Who?	(who is able to help?)

3. Confine to communication — Amateur radio is perhaps the last communication possibility in case of emergency. Confine to it. Leave advice and planning of aid to persons and institutions in charge of emergency relief.

4. Message form — Establish contact with persons and organisations involved in the emergency or the relief actions and help them by relaying their traffic. Communication is most efficient if a message reaches its destination written down exactly as it left the originator. So any originator should write down his message (telegram style) with a sufficient address and normally a sufficient signature.

Example:

doctor brown river city (address)
refer to your message November 16
1230utc stop how many units of xyz do you need (text)
smith red cross seatown (signature)

5. i Preamble

The station which puts the message into the amateur radio network composes the *preamble*. The preamble contains the following information in the following order:

number
precedence
station or origin
check (number of words in text)
place of origin
filing time
filing date

The number is a serial number assigned to the message
The precedence may be: emergency — p priority — r routine
The station of origin is the call of the station which first sent the message over the air
The place of origin is the place (city, town, village, ship) from where the originator sends his message
The filing time and filing date is the time when the message was originated in UTC

Example:
nr 32 p XY1ZZ 26 pool-town 2215 jan 14 = red cross lake city
please send us information about following persons stop waiter smith harbour street 4 stop adam brown and family walter avenue 16 stop eva black rain-way 28 =
information bureau for river district disaster +

ii Quick preamble

For traffic in VHF-FM nets where communication is easier you may use a shorter type of preamble.

number
station of origin
filing time

The number is a serial number assigned to the message
The station of origin is the call of the station which first sent the message over the air
The filing time is the time when the message is originated

Example:
N4 4 XY1ZZ 1832 =
hospital lake city
two more ambulances needed at harbour street +

6. Operation example — phone

— YX1AA this is XY1ZZ, I have a message, over
— this is YX1AA. I am ready, over
— message beings,
number four x-ray yankee one zulu zulu one eight three two,
address
hospital lake city
text,
two more ambulances needed at harbour street,
message ends, over
— repeat word after more, over
— more ambulances over
— received number four YX1AA out
— ok XY1AA out

7. Operation example — CW

— YX1AA de XY1ZZ qtc k
— de YX1AA qrv k
—.—.— Nr 32 p XY1AA 24 poor town 2215 Jan 14
—. . .—
red cross lake city —. . .—
please send us information —. . .—
information bureau for river district disaster .—.—.
— wa please k
— please send k
— de YX1AA qsl 32 sk
— de XY1ZZ ok sk

message begins —.—.—
separation sign —. . .—
message ends .—.—.

8. Phonetic alphabet:

— to avoid confusion use only the following phonetic alphabet

alpha	november
bravo	oscar
charlie	papa
delta	quebec
echo	romeo
foxtrot	sierra
golf	tango
hotel	uniform
india	victor
juliet	whiskey
kilo	x-ray
lima	yankee
mike	zulu

9. Special CW/RTTY abbreviations for emergency traffic:

QOD? Can you communicate with me in — QOD I can communicate with you in . . .

0 Dutch	5 Italian
1 English	6 Japanese
2 French	7 Norwegian
3 German	8 Russian
4 Greek	9 Spanish

QTV? Shall I stand guard for you on the frequency . . .kHz (from . . . to . . . hours) — *stand guard for me on the frequency . . .kHz (from . . . to . . .)*

QTX? Will you keep your station open for further communication with me until further notice (or until . . .) — *I will keep my station open for further communication with you until further notice (or until . . .)*

QUA? Have you news of . . . — *here is news of . . .*

QUF? Have you received the distress (emergency) signal sent by . . . — *I have received the distress (emergency) signal sent by . . .*

QUM? May I resume normal working — *normal working may be resumed*

QRR? Are you ready for automatic operation — *I am ready for automatic operation*

10. What to do afterwards:

— do not forget to inform your national society about your emergency — or welfare traffic handling.
— why not publicise our good work?

ar

IS THIS THE YOUNGEST?

A five-year-old kindergarten student, who took a crash course in amateur radio at the urging of her amateur parents, became the Japan's youngest licensed amateur radio operator.

Itsuka Matsunaga, daughter of 43-year-old Mikio and Yasuko, 42, and residents of Abahiri, in north-eastern Hokkaido, claimed the examination was not difficult. Itsuka's 11-year-old brother, Masafumi, is also an amateur.

For the examination it was necessary for her to learn the complicated *kanji* (Chinese characters). Average Japanese students begin learning *kanji* in primary school.

Itsuka became interested in radio last August and began a 36-hour course offered over 12 days by the Japan Amateur Radio Operators Association on 17th March and took the final examination on 9th April.

The examination is divided into two parts, radio engineering and radio wave control law, with 10 questions and maximum marks of 100 for each part.

Contributed by David Thompson VK2BDT and abridged from THE STRAITS TIMES, 26th April 1986

WICEN and OFF ROAD RACING

Brian Mennis VK4XS
11 Jethro Street, Aspley, Qld. 4034

"All passage control points, this is WICEN base, the race started on time at 0700" . . . and another major exercise involving WICEN groups from Brisbane, Ipswich, Dalby, and the Gold Coast, was underway on Sunday, 13th April 1986.

The occasion was the first round of the 1986 Goodyear Wrangler Off Road Championship in the Kooralbyn Valley, about 70 km south of Brisbane. For the third year, WICEN had been requested to provide a safety net and a scores-reporting system to assist in the efficient running of the event. WICEN's participation over the last three years follows the previous, and continuing, successful involvement with other rallies conducted by the Brisbane Sporting Car Club (BSCC). (See *Rallying and WICEN*, AR July 1984). The 1986 Rally came at a difficult time for WICEN, as it conflicted with the 1986 Club's Conference, and also another WICEN exercise of a more sedate nature, one involving horses. However, sufficient operators were found for both exercises without any difficulty.

Terry VK4ATH, operating at a check point.
Photograph courtesy VK4AG

The Rally is run over six circuits of a track in the hills between Kooralbyn and Boonah to a total race distance of 400 km, with an average of 150 competitors in several different classes of off-road vehicles. WICEN was required to man a base station plus nine control points, with each control point reporting back to base the time through the point for each car.

A little arithmetic shows that 150 x 9 x 6 equals 8100 transit times had to be handled by the network. In addition, incident reports, drivers requests for assistance and rally operational traffic all added to the load. While the worst case had to be planned for, in actual fact the attrition rate in the event saw a very significant number of cars drop out with a consequent drop in traffic over the duration of the race.

To handle this traffic, four different frequencies were used in the first two years, 10m, 6m, 2m, and 70cm. This year, the same bands were used, but with two frequencies on both two metres and 70 cm. As well, 80 metres was available as a standby.

The base station in 1986 was located in the same tent as the Rally Operations Base, and was set up and operated by Angus Garland VK4AGQ, ably assisted by Fred Saunders VK4AFJ, and a team of operators. Setting up a base station for all these frequencies is a rather lengthy job, and Angus, together with some of his assistants used Saturday afternoon to install the equipment and to erect and connect the various antennas.

At the 1984 Rally, the first year WICEN provided communications, the Queensland State Co-ordinator of WICEN, Ken Ayres VK4KD, brought his WICEN mobile base station from the Gold Coast, which was then used as a base station for most of the frequencies. Angus VK4AGQ, provided a two metre and a 70 cm channel from his car. With the WICEN mobile base no longer available, location of the Base Station in 1985 was not particularly good, but by 1986, the organisers had realised our problems and requirements, and were able to meet most of them.

Most of the time, 80 metres was a dead-loss because of electrical interference on receive, and on transmit the signal interfered with the PA system. Angus' car was used as the base mount for several of the VHF/UHF antennas.

Some of the base crew hold-up the antenna farm. From left: Angus VK4AGQ, Fred VK4AFJ, and Cecily VK4QW.
Photograph courtesy VK4NPL

The WICEN operation each year has been under the overall control of Geoff Adcock VK4AG, but with his interest in cars, Geoff wanted to be out with the action, and for the first two years elected to man a control point. These points were located in suitable positions around the track, and were manned by several time-keepers and at least one WICEN operator.

With the early start, most operators elected to arrive on Saturday afternoon, set up their equipment and antennas, then camp over night ready for the next morning.

Geoff VK4AG, (in hat), and Paul VK4ZEM, assemble one of the 70 cm repeater aerials.

The biggest problem at the control points was not the amount of traffic, although it was heavy in the first round, but the dust. The amount of dust created by 150 cars over six circuits of the track, even allowing for the number that dropped out, has to be seen to be believed. If the wind blew constantly from the one direction, it was possible in some cases to locate the control point up wind of the track, but with the variable winds the dust just had to be endured.

In planning the 1986 event, the organisers made a tentative decision to establish a sub-base at Boonah, to the west of the main rally circuit. They advised that they expected a lot of radio traffic from there back to the main base, and requested that a radio link be allowed for in WICEN planning. This was a problem as Boonah would be inaccessible on VHF/UHF, and 80 metres was undesirable as mentioned earlier.

Once more, it was a case of Geoff to the rescue. He had obtained a surplus commercial repeater some time previously, and with the addition of control and identification boards plus the appropriate crystals, soon had VK4RWI operating on 70 cm, as a portable WICEN repeater. Geoff's job in the 1986 rally was to set up and monitor the operation of this repeater on a prominent hill which was in line-of-sight from Boonah, and line-of-sight from the main WICEN base.

Another of Geoff's self imposed tasks, to the great gratitude of the BSCC was to service and make operable the commercial VHF high band radios owned and operated by them. As the Club previously had communication problems in the various areas of the circuit, Geoff also volunteered

The 70 cm antenna being erected by Paul VK4ZEM, assisted by Greg Mennis and his friend Mark McGrath. Geoff VK4AG, (partially obscured) works on the feeder.

to provide a relay service from his hill for them.

Because of various problems, the BSCC were unable to finalise their proposals to use Boonah and, as it turned out, this was lucky for WICEN. On Saturday afternoon Murphy struck, and VK4RWI, which had been operating perfectly, developed a fault. This was fixed, but the repeater again became faulty on the Sunday morning. With the equipment available on-site, the fault could not be located, and the repeater had to be closed-down. (It was eventually diagnosed as an errant blob of solder, which was making an intermittent short on one of the circuit boards). Only one check point was in a difficult location, and really needed the repeater, but by means of a quick bit of finger work on two transceivers by Paul Mead VK4ZEM, who was assisting Geoff at the repeater site, all traffic was passed without any delay.

Paul VK4ZEM, working on two transceivers.
Photograph courtesy VK4AG

Geoff was kept very busy on his hill, and the comment was made that he seemed to be operating on one frequency or the other all day until the net closed at 1730.

No figures were available for the total number of messages handled by the net during the day, but the author's control point originated 65, both scores and incident reports. Taking that as an average, and multiplying by nine gives over 500 messages through the base station. This is a not inconsiderable number to handle in about nine hours.

None of these messages reported any serious injuries, although there have been two accidents with injuries requiring helicopter evacuation during the three events. However, WICEN operators were not at the scene and had no part in their reports.

They even run their rally cars on three wheels!

David VK4AFA, at his mobile shack.
Photograph courtesy VK4AFA

The value of the scores messages lies in two directions. Firstly, in keeping a running location of each vehicle for safety purposes, and secondly, in having times at each control point reported quickly for scoring purposes. Normally WICEN results are accepted as transmitted, having been proved so reliable in the past. However, this was proved and also the usefulness of the information clearly shown, during the hearing of a protest that followed the 1985 event. Using a large scale map of the track, model cars, and the recorded and transmitted times, officials of the BSCC were able to show the relative location of the cars involved in the protest over the whole circuit, and were easily successful in having the protest dismissed.

And so, once more WICEN participated in a very successful exercise showing its value in message handling under portable conditions. The only incident to mar an otherwise successful day was an accident involving Graham Reuter VK4YEA, on the return journey to Brisbane, resulting in many dollars damage to his car. Even then, WICEN operators were quickly on the scene to render what assistance was needed.

The various WICEN groups involved in providing communications at this rally look forward to other similar exercises in the future.

ar

FAMOUS PEOPLE

In the QSP, page 63 December Amateur Radio, the question was asked if any readers could add to the list of well-known amateurs.

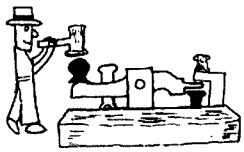
VK6QU draws attention to the fact that the President of the Italian Republic, Franscesco Cossiga is licenced amateur I0FCG.

VACUUM TUBE IC

Designers at Los Alamos National Laboratory have manufactured a *Vacuum Tube IC*, containing about 200 triodes and measuring about 40 mils on a side.

Such gadgets will be the *in* thing within a few years, providing that nothing unforeseen happens in the political arena. The reason behind the research to make a vacuum tube IC is to find something with small dimensions, tube characteristics such as high temperature operation, radiation resistant and having a substantial forgiveness of voltage surges. The only thing not clear as yet is whether or not the small geometries associated with the micro-tubes translate to a correspondingly improved high-frequency performance.

From *QRM*, March/April 1986



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

It is a cold, rainy and generally miserable afternoon here in Adelaide as I write this, toward the end of April. The phrase *April showers bring May flowers* springs to mind, but somehow I don't think it will work. Anyhow, it is not the sort of day for doing anything particularly strenuous, so I thought I would take the opportunity to catch up on some odds and ends, like this column. And within this column, the subject for the month will be . . . you guessed it — *odds and ends.*

For starters, the gremlins got into the April edition of *Pounding Brass.* I quoted the price of the Automorse mechanical keyer as being 50 pounds — this should have been five pounds (about $10 decimal).

The price of five pounds was quoted to me as being about a week's wages at the time (around the 1920s), so this would possibly be about $400 in today's money.

The question of the last Morse telegraphy transmission in Australia prompted a response from Gordon Brown VK1AD, who says:

"Speaking of the last Morse message in Australia — and I presume we are talking about the old sounder system as used by the PMG — I can go nearly 10 years better . . . well 11 years actually, than the Lord Howe link. If memory served me correctly, the Lord Howe link was from Brisbane Chief Telegraph Office (CTO) and was always manually operated (not machine Morse) as the volume of traffic did not warrant any such new fangled ideas.

"However, I digress . . . there was a working Morse line in use between Melbourne CTO, Canberra CTO, and Sydney CTO. Now, we are getting into semantics here when we talk about 'working Morse lines'. The Melbourne/Canberra/Sydney link was what we call an 'order wire' . . . a line which is used for passing instructions when testing lines, and would carry such instructions as 'key line 124', or 'let me see an earth on that', or 'don't see your loop on tt mate' . . . things like that. It was only taken out of service about two years ago, mainly because the engineers had forgotten it was there, but we 'testing officers' found it very useful. As it was not used for passing public traffic it might not qualify for the 'last Morse line in Australia' stakes."

Gordon also reminded me of the poems by telegraphist, Frank "Spru" Spruhan, including *Coming Round the Bend,* which was really the kick-off and inspiration for this column when I submitted it to Amateur Radio in June or July 1983. It is worth reprinting.

In January, I received a letter from Syd Clark VK3ASC, parts of which may be of interest as they provide some interesting historical material and refer to books which would be recommended reading for anyone interested in the history of wireless telegraphy.

First on Syd's list is the *Admiralty Handbook of Wireless Telegraphy 1925,* which covers spark, arc, and alternator systems, and an early valve transmitting system. From Syd's letter:

"Before the discovery of 'short waves' there was much competition between various countries and individuals and patents were jealously guarded. Marconi won out with his spark system primarily because of the frequency range that could be covered with transmitters varying from a few watts to many kilowatts, but not before he began using quenched spark gaps and coupled circuits between the spark gap excited 'oscillator' and the aerial circuit. The original Marconi transmitter had the spark gap in series with the aerial but this was far to heavily coupled for anything but a broad band jammer. It also wasted much power.

"The arc had advantages — because of the more nearly 'T9' note but keying was a problem and that required either a frequency shift (Figure 206) with a spacing wave on 2027m (148 kHz) and marking wave on 2000m (150 kHz), or the other common method which was to shift the arc onto a dummy load circuit called a back shunt circuit. Arcs had the problem of preventing ships from 'listening thru.'

"Para 389 gives three methods of generating signals, (a) Poulsen arc, (b) transmitting valve, (c) HF alternator. The arc is quoted as giving greater ranges power for power and sharper tuning compared to spark. It was considered to have a very serious drawback so far as ships were concerned because the arc had to be switched off completely to listen and it was slow to start up. The book says 'arcs up to 1500 kW are in operation.'

"HF alternator systems are mentioned only briefly because they are limited in frequency, even 100 kHz being high for them.

"A second book, Wireless Telegraphy *by Zennsch (translated Selig, McGraw Hill 1915) appears to rather nicely fill the gaps and approaches things from a rather more academic point of view*

"The Summer 1985 issue of the Royal Naval Amateur Radio Society newsletter devotes pages 16-20 to a review of a newly published book by G A G Brooke titled Jackson, the Father of Maritime Radio. *It deals mainly with the early history from 1896 to 1901, and makes available information from files opened by the British Freedom of Information legislation."*

Thanks again Syd for an interesting and informative letter, and I would like to take this opportunity to thank all my correspondents, who make writing *Pounding Brass* a pleasure.

Now, to lighten your day, some classic telegrams from the book *Coming Round the Bend, and Other Verse.*

From a lady to her daughter on the birth of the latter's first child — *Baby not marvelous / I have 28 teeth and can jump backwards / present following — Gran.*

From the pugilist in Kalgoorlie to his dad in Sydney — *Won easy / in 75 rounds.*

From a Frank, aboard ship between Melbourne and Brisbane — *Dreadful voyage / Ship crowded / Gave birth to two girls.*

And from a worried migrant — *What the reason is why no you write!*

The essence of speed and efficiency in CW working is the ability to abbreviate words, a technique referred to by generations of manual telegraphists as *cutting down.* Of course, an abbreviation is only useful so long as both parties understand it as this poem clearly illustrates.

COMING ROUND THE BEND

I well remember Charlie Teede,
Who used to work the races;
No need, indeed, to ask for speed,
He'd pace it with the pacers.
Lord help the man who 'broker' him once
Or questioned his 'creations;'
On him a flood of scorn was turned
The atmosphere with brimstone burned,
And Pitman, green with envy squirmed
At his abbreviations . . .

TE FIELD GOT WL AWA TO TI
& AS TY SETTLD DWN
TE SHICER 1ST T BK TE LI
WS FLWD BI JO BROWN,
IN CLOSE PROXIM WS TIRED TIM,
TN CME ARBTRATN,
BHND TE BUNCH WS CNTR LUNCH,
GD LUCK & HIT TAXZTN.
TY WHIZZED ALNG (AND SO DID CHARLES)
WTOUT TE LEAST CESSATN.

C R T B TE TOPWT JUMPED
& GOT TRMS WI SHICR,
WO TN & TRE HS BUNDL DUMPD
WH LABLD HM A TWICER.
I scramblked after Charlie
Like a traler round a bend,
Then gave OK, but queried;
C R T B U SEND.
NOW WHAT IS THAT IN AID OF?
ENLARGE A BIT MY FRIEND.

The sounder nearly hit the *roof*
As Charlie scorched the line.

U ORT T B ON TE RABTPROOOF
OR UP AT DOODLEKINE.
CHASIN PODDIES RND TE YD
SHD B UR CHF PASTIME.
T TNK U CDNT WRK IT OUT
IT NRLY MAKES ME SIK.
ANI OLE GIN OR ROUSABT
CD WRITE IT WI A STICK.

FACI A MAN WO CALLS HMSF
A TGST ASKG TT.
A RECORD O S VACUUM
IS LOCATED NEATH UR HAT.
D U WANT IT IN OILS BI LAMBERT?
OR CARVD ON A MARBLE STONE?
OLE WINJA MORTILL CD TKE IT
& UD NVR HR A MOAN,
NOT SPELT OUT LI IVE DUN FR U
BUT CUR DWN T TE BONE.

WL I MST SA ITS TE BST DISPLA
OF IGNRCE IVE HEARD,
O ALL TE SOUTRS IN WA
UR CRTNLI TE BIRD
& ANI HRSH REMKS IVE MIST
TY ALL CN B INFERD.
C R T B, ITS KNOWN BI ROTE
WT WD U HA ME SND?
ITS CMG RND TE BEND, U GOAT
COMING ROUND THE BEND!

73 until next month.

ar.

MORSE CODE MAN

Mr Jack Sykes, aged 84, is believed to be the only remaining British manufacturer of Morse keys. Jack works in the kitchen of his home at Slaithwaite, near Huddersfield, west Yorkshire.

He began his career as a radio operator in 1918, and now supplies key to amateurs all over the world.

Jack in now moving into new technology and proposes to convert his car port into a room where ne can experiment with computers.

Contributed by Tom Laidler VK5TL, from *The London Times*

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW, 2868

MEMBERSHIP LIST as at 31st March 1986

Charlene VK1NEJ	21 February 1982
Kathleen VK2ACP	1 October 1980
Betty VK2AMU	9 March 1981
Jan VK2CJM	8 March 1986
Dorothy VK2DDB	17 March 1983
Norma VK2DJO	20 August 1975
Elwyn VK2DLT	22 July 1980
Beryl VK2DVL	11 August 1979
Joy VK2EBX	25 January 1980
Heather VK2HD	22 October 1978
Marlene VK2KFQ	11 November 1983
Joyce VK2MI	5 November 1976
Margaret VK2MV	20 March 1982
Maree VK2NKN	6 August 1981
Nancy VK2NPG	7 November 1985
Margaret VK2PNG	23 March 1981
Bobbie VK2PXS	6 October 1977
Freda VK2SU	26 July 1980
Wendy VK2YQK/VKD	20 March 1982
Jean Darling	23 November 1983
Lorrie VK3ACO	6 May 1979
Rae VK3AYL	20 April 1976
Alma VK3BAE	4 March 1985
Mavis VK3BIR	23 August 1975
Joan VK3BJB	2 August 1976
Mona VK3BRE	1 September 1976
Janet VK3BTU	1 September 1977
Barbara VK3BYK	1 February 1984
Valerie VK3CVW	22 February 1985
Margaret VK3CWA	25 March 1981
Kim VK3CYL	8 November 1983
Jan VK3DMH	24 July 1985
Margaret VK3DML	8 June 1977
Marilyn VK3DMS	24 October 1977
Valda VK3DVT	25 March 1981
Bron VK3DYF	6 November 1982
Gwen VK3DYL	20 April 1981
Marjorie VK3HO	3 October 1976
Mavis VK3KS	22 August 1975
Joan VK3NLO	19 October 1981
Judith VK3NYL	26 July 1985
Bonnie VK3PBL	11 May 1983
Dale VK3PEH	26 November 1982
Clarice VK3UE	29 October 1976
Jessie VK3VAN	12 February 1981
Joyce VK3VBK	17 March 1979
Austine VK3YL	5 April 1976
Jean Truebridge	3 August 1975
Kate Duncan	11 August 1975
Raedie Fowler	16 November 1976
Muriel May	9 June 1979
Bronwyn Lewis	2 October 1980
Jean Shaw	12 December 1983
Chris VK4ABN	14 July 1979
Sandra VK4ACJ	22 July 1980
Margaret VK4AOE	10 October 1980
Jill VK4ASK	8 October 1984
Connie VK4ATK	1 September 1982
Dulcie VK4BDH	6 January 1981
Eleanor VK4BEM	1 May 1985
Betsy VK4BET	24 September 1985
Wendy VK4BSQ	2 March 1982
Anne VK4FAB	12 June 1981
Lori VK4FFQ	27 June 1984
Phyl VK4JFA	12 January 1981
Dorothy VK4NAM	21 May 1976
Candy VK4NES	23 December 1985
Iris VK4NME	5 September 1982
Valarie VK4NNJ	21 August 1979
Mary VK4PZ	9 March 1981
Cecily VK4QV	9 September 1983
Josie VK4VAN	27 February 1985
Val VK4VR	7 April 1983
Jenny VK5ANW	21 April 1976
Meg VK5AOV	26 November 1983
Maria VK5BMT	9 April 1986
Judy VK5BYL	20 March 1982
Lorraine VK5LM	4 April 1976
Carol VK5PWA	14 July 1983
Marlene VK5QO	12 February 1981
Joy VK5YJ	14 July 1979
Denise VK5YL	20 April 1976
Pauline Koen	24 December 1983
Gill Wardrop	13 March 1986
Bev VK6OE	2 March 1980
Helene VK6HI	23 November 1983
Sue VK6NSU	2 October 1980
Inge VK6OV	31 March 1985
Trish VK6QL	3 December 1984
Margaret VK6QM	21 June 1980
Poppy VK6YF	3 July 1978
Gillian VK6YL	15 September 1976
Christine VK6ZLZ	17 December 1983
Olive Couch	21 October 1977
Daphne Hugo	25 August 1980
June Greenaway	24 December 1983
Lynda Francis	13 May 1985
Helene VK7HD	29 December 1977
Grace VK7NNN	9 July 1985
Sue VK7ZSU	25 August 1979
Moira VK8NW	9 April 1986
Christel DF1LV	11 December 1982
Christa DJ1TE	15 September 1979
Anny DF2SL	15 September 1979
Heidi DF3LX	12 March 1983
Margot DK5TT	1 November 1981
Aimee FK8FA	22 October 1984
Sheila G3HCQ	20 May 1981
Ann G4EYL	28 March 1981
Diana G4EZI	19 December 1978
Rae G4JMT	8 March 1984
Cilia G4KVR	1 November 1981
Joy G4OUZ	17 December 1984
Dee G4VFC	17 December 1984
Jeanette Arter	17 December 1984
Shirely GM4LUS	20 December 1980
Anne GM4UXX	23 May 1984
Kay GM6KAY	17 December 1984
Fumi JA1AEQ	21 September 1984
Akiyo JH1GMZ	8 February 1985
Nanako JI1VLV	8 July 1984
Mizuyo JE6JOC	30 January 1984
Etsuko JA6KYP	14 January 1985
Jean K1IJV	23 March 1981
Karla WA1UVJ	10 December 1979
Phyllis W2GLB/7	23 July 1976
Christine WB2YBA	1 June 1978
Jeanne KA3CEO	19 January 1984
Liz W3CDO	1 November 1978
Mary Ann WA3HUP	6 October 1981
Ruthanna WB3CQN	30 March 1981
Lois WB3EFQ	19 October 1983
Edith WA4SRD	17 October 1979
Betty KA5ONE	20 November 1985
Mary KE5UO	10 February 1986
Carol KK5L	11 May 1983
Darleen WD5FQX	16 January 1985
Betty AG6C	1 August 1985
Jerrie K6INK	9 June 1979
Joanie KA6V	16 October 1982
Mary KB6CLL	22 October 1984
Maxine N6GGR	28 December 1982
Claudia N6GZW	27 June 1985
Joanne N6LFZ	1 August 1985
Jessie WA6OET	17 January 1984
Martha KA7CRO	2 March 1982
Daurel KC7TE	21 December 1977
Gerry KD7RA	19 January 1984
Lynn ZL2PQ	25 December 1982
Pauline ZL2QW	4 November 1983
Pearl ZL2QY	22 April 1976
Gail ZL2TZG	17 January 1985
Carol ZL2VQ	30 October 1983
Lee ZS1YL	27 January 1986
Diana ZS6GH	1 June 1978
Pat ZS6VC	20 November 1983
Alice KD7SH	26 April 1984
Joan KD7YB	11 April 1983
Jan KF7F	20 December 1978
Shirlee KO7Y	1 October 1980
Marion WA7TLL	29 January 1986
Lee KB8RT	2 October 1980
June KM8E	10 February 1985
Shirley WD8HEV	1 February 1984
Ann K9RXK	22 August 1983
Zdena OK2BBI	13 February 1986
Marie-Jeanne ON4AYL	1 September 1985
Agnes PA3ADR	12 June 1981
Hil PA0HIL	12 June 1981
Paula PA0ULA	1 November 1981
Inge PY2JY	23 June 1984
Hallie VE6AUP	1 October 1980
Elizabeth VE7YL	1 October 1979
Bobby VE7CBK	28 October 1978
Rae VE7CIX	28 May 1978
Muriel VE7LQH	10 October 1985
Junia YJ8NJW	6 February 1985
Aola ZL1ALE	12 December 1979
Celia ZL1ALK	1 November 1981
Win ZL1BBN	26 December 1985
Clarrie ZL1BDZ	18 March 1977
Elva ZL1BIZ	17 April 1982
Lesley ZL1BOR	11 May 1980
Gail ZL1FV	8 November 1983
Shirley ZL1MY	20 November 1983
Vicki ZL1OC	11 September 1977
Cathy ZL2ADK	30 October 1982
Alma ZL2AWP	17 December 1984
Biny ZL2AZY	11 January 1981
Jos ZL2BAO	1 November 1981
Marilyn ZL2BOA	16 September 1984
Jeanne ZL2BOD	26 December 1982
Anne ZL2BOV	23 January 1984

ALARA BIRTHDAY ACTIVITY DAY

July is an important month for ALARA, *born* 26th July 1975.

Last year we organised a Birthday Mini-Contest, but this year we have decided to hold a special YL Activity Day to celebrate our 11th birthday. (Details were in June Amateur Radio). We are hoping the earlier starting time, 0400 UTC will give some of our DX friends a chance to call in. It would be nice if the sun could develop *measles* about then, but this might be too much to hope for.

We are hoping to hear from a many YLs as possible, so do try and join us, even if you can only spare a few minutes. Make a note of the date — Saturday, 26th July.

MRS FLORENCE McKENZIE CW TROPHY

Firstly, I had better set the record straight, (May AR). This trophy is awarded annually to the VK Novice YL operator with the highest CW score in the ALARA Contest. (Not the highest scoring VK YL). I guess the gremlins took over, and I omitted a most important word. My apologies.

While on the subject of the Mrs Florence McKenzie CW Trophy, I would like to stress that *all* novice YLs are eligible to compete for it, whether members of ALARA or not. The minimum attainable score of 50 points. The actual trophy, because of its size and weight, will not be forwarded to the winner, but an attractive certificate bearing a photo of the trophy will be sent to the successful novice YL each year.

How about dusting off those keys and giving it a go? There are plenty of CW operators anxious to give you a contact. (Remember also, that the points are doubled for CW contacts). If you have not actually attempted a CW contact before, the ALARA Contest is a very good starting point. You will probably find, as I did, that the majority of operators are very helpful to newcomers, and will readily adjust their speed to yours. It is not necessary to be a real *whiz-kid!* After a contact or two, you may even begin to find that it is more fun than you thought!

ACTIVITIES

VK3 will be having a birthday luncheon on Sunday, 27th July 1986, at the QTH of Jessie VK3VAN. All YLs are welcome — please bring a plate.

The VK5 Annual Get-together will be held this year on Sunday, 20th July, at 12.00 at the Belair Hotel, and afterwards for coffee at the QTH of Joy VK5YJ. OMs are invited to join in for coffee from 2.30pm. Please contact Meg VK5AOV before 10th July.

In the John Moyle Contest, Bev VK6DE, worked the six hour section from a beach at Geraldton with the Geraldton Amateur Radio Group.

Gill VK6YL, and Cristine VK6ZLZ, worked the 24 hour section from Penguin Island with the WA Repeater Group.

Heartiest congratulations to Jenny VK5ANW, on becoming President of the WIA — VK5 Division. We are very proud of you, Jenny.

Congratulations also to Mavis VK3KS, and OM Ivor VK3XB, on attaining the first CW certificates in the SA Jubilee 150 Award.

In addition, Mavis was the first YL to gain the Award on CW.

CONDOLENCES

To Mona VK3BRE, whose OM Alec VK3AAP, became a silent key in April.

Many who knew Kathy VK5NKM, of Coober Pedy, will be sorry to hear of the death of her OM, Lester, a few months ago.

NEW MEMBERS

We are pleased to welcome: *Moira VK8NW; Maria VK5BMT; Lee ZS1YL; Marion WA7TLL; Mary KE5UO; Zdena OK2BBI and Gill Wardrop.*

Helen GM4KNQ has now changed her call sign to G4KNQ.

Correction to April AR — Alma is VK3BAE not BAO as published.

SUBSCRIPTIONS

It may not be generally known that a reduced subscription rate is available, on application, for full pensioners and full-time students.

Until next month — 73/33, Joy VK2EBX.

QSP

RESISTOR KIT

A Mini-Melf (SMD) laboratory kit contains 6050 metal film resistors divided into 121 different values of 50 pieces each ranging from 10 ohms to 1 megohm.

Each resistor value is packed in its own plastic phial, which is held in two plastic tray dispensers with the resistors clearly identified. Total housing size is 300 x 245 x 35 mm.

The kit is complete with technical data, pocket colour code chart and colour wall chart.

From *Electronic News*, p10 — April 1986

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED RECENTLY

WORKED ALL STATES — VHF (144 MHz)
169 Roger Bowman VK5NY

DXCC OPEN SECTION
233 John Meagher VK2AMV

WORKED ALL VK CALL AREAS
1456 Hiroshi Sugimori JA3PG
1457 Roger Hunter GW4OFQ
1458 Serge V Sasov UR2RKS
1459 Vladivostok Club Station UK0LAA
1460 Prymorskyy Club Station UK0LAG
1461 Victor Wasilev UA9UKL
1462 Gennadi Igumnov UA0FCA
1463 Gennady V Treus RT5UD
1464 Nikolaj Sergienko UB5UAL
1465 Yakutsk Club Station UK0QAA
1466 Vladmir Chernukhin UA0FDD
1467 Oleg W Lagurashwili UA3TDX
1468 V A Andreyev UB5ICD
1469 Yuri Petropavlovski UA6LBO
1470 George Ignatov UB5HBT
1471 Kemerovo Club Station UK9UBM
1472 V F Salomatin UV3FO
1473 Igor L Zeldin UB5LCV
1474 Alexander L Rubtsov UJ8JCQ
1475 Vladimir Trusov UA0LBM
1476 Riga Club Station UK2GDZ
1477 J Jans Fauzy YB6MF
1478 Ruduger Hoff Y23DG

HEARD ALL VK CALL AREAS
110 Alexander Zhigachov UA6-101-62
111 Serge Nesterov UB5-059-258
112 Nickolaj Kostigin UA3-170-1106
113 A Fyodorov UA1-169-738
114 Leonid Ilich UB5-080-133
115 Yuri Bodrov UB5-070-546

VK5 JUBILEE 150 AWARD

Amendments to rules with effect from 2359 UTC, 12th May 1986

If after the above time, you work someone who already holds this Award, the contact brings you an extra 15 points; if this person holds two certificates, an extra 30 points; three certificates, 45 points, etc. For these extra points, the certificate number/s must be exchanged and quoted in the application. Also, the extra points can be claimed only once per station, per band.

If claiming these extra points, band points cannot be claimed in addition, except for new contacts.

Thanks to Graham Horlin-Smith VK5AQZ, for supplying this information.

THE WORKED ALL BRITAIN AWARDS

The Worked All Britain Awards (WAB) Group was founded in 1969 by the late John Morris G3ABG, to promote a greater amateur radio interest in Britain.

The group promotes an award program, contests and activity weekends.

WAB makes regular donations to groups such as the Radio Amateur Invalid and Blind Club, who help less fortunate members of the amateur radio fraternity.

The award program is based on the geographical and administrative divisions of Britain. QSL cards are not required, only log entries. Special log books are available to assist in the claiming of awards.

The award scheme is open to licenced amateurs and Short Wave Listeners.

BASIS OF THE AWARD SYSTEM

Great Britain and Northern Ireland are divided geographically into a grid system. In Great Britain this is referred to as the National Grid Reference (NGR) and in Northern Ireland as the Irish Grid.

Both systems divide the countries into 100 km x 100 km grid squares which are referred to as large squares. On the NGR these squares are given a two letter reference; eg HP, SP, TL, etc and on the Irish Grid, a single letter reference, C, D, G, H and J.

These large squares are then broken down into 10 km x 10 km squares which are given a two number reference 00, 01, 02 ... 99. The large square and the two number reference then gives rise to the WAB area; eg SP38, TL00, J04, G82, etc.

Great Britain and Northern Ireland are broken down for administration purposes into counties. The boundaries of these counties are drawn up arbitrarily.

The WAB area is then linked with the county; eg HP61 Shetland Isles, SP38 West Midlands, SS98 Mid Glamorgan, C82 Antrim. There are in excess of 4000 WAB areas.

WAB LOG BOOKS

To help with the logging of WAB contacts, a special log book is produced. This book lists each WAB area, county by county, together with a list of towns and villages lying in each area. Claim sheets for the awards are supplied with this book.

The log book is available, priced five pounds (US$7), from: Brian Morris G4KSQ, 22 Burdell Avenue, Sandhills Estate, Headington, Oxford, QX3 8ED, England.

Please make cheques or money orders payable to *The Worked All Britain Awards Account.*

The main WAB awards are:

WAB OVERSEAS INTRODUCTORY AWARD

This award is open to non-European stations and is intended as an introduction to WAB. The award requires that 25 WAB areas and 10 counties are worked.

WAB AREAS AWARD

This award is given for working WAB areas. There are six classes of award — Basic; Bronze; Silver; Gold; Platinum and Sapphire. The requirements are 100; 200; 400; 600; 800 and 1000 areas.

WAB COUNTIES AWARD

There are 78 counties in Great Britain and Northern Ireland. Awards are given for working 55 and 76 counties.

WAB LARGE SQUARES AWARD

There are 61 large squares in the WAB list. Awards are given for working 30, 40 and 55 large squares.

WAB NEWSLETTER

A regular newsletter is produced containing information about WAB.

WAB QSL CARDS AND STICKERS

Attractively designed and priced QSL cards and stickers for your existing cards are available.

New members are assured of a very warm welcome.

ar

WIA 75 AWARD RECIPIENTS

The following amateurs are now recipients of the WIA 75 Award.
Cert. 659 D A R Rosan ZLAFQ
Cert. 660 Gunawan Wibisono YC0BOK
Cert. 661 Tsuneo Ohmae JR3JBA
Cert. 662 William (Bill) Shell WA6IET
Cert. 663 George Djatmiko Jiman YB3CDL

VI PREFIX

Between 1st July and 1st December 1986, amateurs in South Australia may use the VI5 prefix, to help celebrate the 150th Anniversary of the founding of the State.

For amateurs outside Oceania, this will present an opportunity to gain the Jubilee 150 Award at a lesser grade than that originally indicated.

The rules as printed in *Amateur Radio,* October 1985, page 47, will gain the Gold level award.

VI5JSA and five other VI5s or 15 VI5s will achieve the Silver award ($2 or 4 IRCs) from VK5OU, Box 1234, GPO, Adelaide, SA. 5001.

Thanks to Rowland Bruce VK5OU, for these notes.

HMAS *CASTLEMAINE* AWARD

The Royal Naval Amateur Radio Society, Australian Branch, has decided to create an award called the *Castlemaine Award* to commemorate the 75th Anniversary of the Royal Australian Navy and the 45th Anniversary of the launching of HMAS *Castlemaine.*

It has been arranged by members of the HMAS Castlemaine Group of the Royal Naval Amateur Radio Society, who will supervise the checking of logs and issuing of Certificates.

The Award shall be open to all radio amateurs and SWLs on a heard basis.

Applicants must establish two-way radio amateur communications with RNARS members residing in Australia. Points will be awarded on the basis of one point per VK RNARS member, or any VK RNARS special station, two points per HMAS Castlemaine Group member and three points for radio contact with the wireless office (VK3RAN) on board HMAS Castlemaine at Gem Pier, Williamstown, Victoria. Applicants must have contacted one HMAS Castlemaine Group member and one contact with VK3RAN HMAS Castlemaine to become eligible for the Award.

The commencement date is retrospective to 1st January 1986.

To qualify, the following is required:

For amateurs residing in Australia and New Zealand — **SSB** 20 points or **CW** 10 points.*
*For amateurs residing in Oceania — **SSB** 15 points or 10 for **CW**.*
*For amateurs residing outside Oceania — **SSB** 10 points and seven points for **CW**.*
(For the purpose of this Award, it is proposed that ZL amateurs be grouped with **VK** amateurs, rather than Oceania).*

In addition, for amateurs residing outside Oceania, contacts with VK RNARS members (Including VK3RAN Group Members) and with VK3RAN HMAS Castlemaine Radio Office on the 3,5 MHz band will count double points.

For the purpose of this Award, any RNARS Maritime Mobile Member, when located inside Australian Waters, will be counted as a VK member.

The Award will be endorsed only at the request of the applicant, for the following endorsements: All CW; All SSB; All 3.5 MHz; All 14 MHz.

Only recognised RNARS frequencies will be used on Nets — CW: 1.830; 3.527; 7.020; 10.140; 14.052; 21.052 ±QRM. SSB: 1.925; 3.613; 7.090; 14.140; 21.165 ±QRM.

The members of the HMAS Castlemaine Group will be rostered for duty in the Wireless Office. In addition VK3RAN will be on air as often as possible on Mondays and Tuesdays for the 1030 UTC 80 metre SSB and CW nets, and the Castlemaine Group members will also be on air on these Nets.

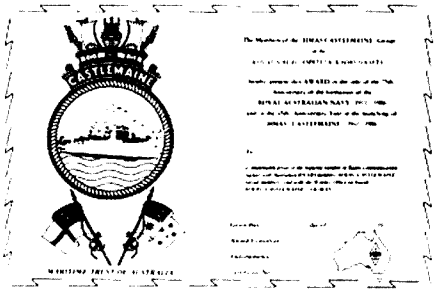
To claim the Award no QSLs are required. Send full log details showing RNARS VK Call Sign; RNARS Number; Date, Time and QTH; Frequency and Mode and an application fee of $A3 to Margaret Nally VK3QU, Award Custodian, PO Box 144, Elwood, Vic. 3184, or to Jean D'Andrea VK3DJN, PO Box 149, Moreland, Vic. 3058.

Please ensure that all cheques are in Australian Currency and are made payable to the RNARS Castlemaine Group.

Please clearly state the endorsements claimed.

Certificates to successful applicants will be forwarded airmail, post paid, as soon as possible after the claim has been checked.

ar



Club Corner

MANLY WARRINGAH RADIO SOCIETY

The Manly Warringah RS wishes to invite all members and visitors to attend the Annual General Meeting on Wednesday, 9th July 1986, at 7.30 pm, where duties such as election of new office bearers and committee will be conducted.

The Manly Warringah Radio Society celebrated 10 years as a radio club, by re-fitting the club radio shack with a new HF transceiver, plus the licensing and installation of a 70 cm voice repeater.

The club repeaters, VK2RMB 146.875 MHz and 438.175 MHz, provide excellent coverage, primarily throughout the northern beaches of Sydney. The Society also operates a multi-protocol packet repeater, which was the first operational packet repeater in New South Wales.

Location is the Warringah Volunteer Services Centre, Aumuna Road (East), Terrey Hills. *ar*

FOREST HIGH SCHOOL

The Forest High School, invites amateur operators, especially ex-students and staff, to participate in an *Amateur Radio Net* to be held on 4th July 1986, as part of the school's 25th Anniversary Celebrations.

The school station VK2KFA will be operating on 80, 15 and two metres (FM and SSB), during the day and will welcome any calls.

For further information contact: The Amateur Radio Group, Forest High School, French's Forest, NSW. 2086.

Contributed by J A Reed VK2KOK
ar

PACKET RADIO IN ALICE

Packet radio was inaugurated in Alice Springs on 14th May 1986, when VK8RP and VK8TJ established a link using a TAPR TNC2 and an PK-64. Quickly to follow on-line were — VK8s TM; BB and ZNO, also using PK-64 TNCs.

The protocol chosen by the Alice amateurs for the local standard is AX.25 Level 2 Version 2, in order to conform with the Region 3 designated standard, as well as to have compatibility with the up-coming amateur satellite capabilities of JAS-1 and AMSAT III-C.

Other amateurs in Alice are also currently working to come up on-line soon.

As all of the amateurs now on packet in Alice Springs are also active on OSCAR, the packet network in Alice Springs will be able to extend beyond its physical isolation via satellite links.

The amateurs involved hope to be able to experiment with such links in the near future with other stations around Australia. If their is anyone interested in trying out an OSCAR packet link with the Alice, or have any information to help, the group will be very pleased to hear from you. Write to Rick VK8RP, 44 Memorial Avenue, Alice Springs, NT. 5750.

Contributed by Rick Pemble VK8RP
ar

DEVIL NEWS from North West Branch

A group of 14 members and three visitors attended the last meeting of the Branch, where all routine matters were attended to.

During General Business, the meeting was told that a new Broadcast List would be prepared shortly by the Southern Co-ordinator.

VK7s OW; KH; SF; EG and ZBT were thanked by Rob VK7KAB, for their assistance with the Rotary Display Auction which was held during May. Rob also suggested that planning work should begin now for TARK 87, and members should begin collecting surplus equipment for the TARK auction.

Planning for Camp Quality is proceeding very well.

On the first Sunday in May, the VK7WI Weekly Broadcast began at 0900 EST and resulted in Andrew VK7ZHA being awarded the Gong Award for the month — he forgot the change of time and slept in!

The club now has its own QSL card for station VK7NW, which coincides very well with the setting-up of the station in another part of the Penguin High School. Recent Activity Nights have been taken up with the *move* as the new room is on the opposite side of the building. As the new room is much larger for the permanent set-up of VK7NW, regular operation from the station should be much better.

Greg VK7ZBT, has been given the job of procuring a Great Circle Map and Bill VK7WL, is to get a large map of Australia for the station wall.

There is still much work to be done with the aerials and Greg has volunteered to make a 70 cm antenna.

There has been very little RTTY operation of late, but with the new location it is anticipated that regular broadcasts will resume. (Just now soon this happens of course will depend on how many volunteers volunteer when needed).

One of the Branch members, Owen VK7OL and his wife Nancy, are doing an extensive trip of the mainland, visiting their children in South Australia and Darwin. They also intend to visit many amateurs along the way. Owen and Nancy are expected home next month.

Meetings of the Branch are held at the Penguin High School, on the second Tuesday of each month, commencing at 7.30pm. Visitors are most welcome and are directed to the venue via the two metre repeater — Repeater 3.

On 20th April, the North West ATV Group commissioned its second Amateur Television Repeater. It is operational under the call sign of VK7RAE.

The repeater is located on Kelseys Tier, near Devonport on the property of Ron VK7RN. Ron has kindly made his property available as a site for the repeater and thanks are extended to him.

The prime role of this repeater is to allow amateurs in the Devonport area to transmit and receive noise-free pictures in Devonport and the surrounding area.

Uplink vision carrier frequency is 444.250 MHz and downlink 579.250 MHz (Horizontal Polarisation). Persons interested in viewing the output channel are reminded that the downlink frequency falls In Band 4 allocation of the UHF Television Spectrum (put simply, this appears at Channel 34½ on a standard UHF television tuner). However, the proverbial piece of *wet string* will prove insufficient for noise-free reception of the device as its power output is relatively low. A good quality high gain antenna cut for UHF will guarantee good pictures.

The radiation pattern is omni-directional with a full 360 degrees in the horizontal plane.

Known amateurs to be transmitting good quality pictures through the repeater are Jack VK7WJ and Andrew VK7ZAR

It may be timely to point out to listeners that we often hear and read that the majority of amateurs are *Black Box* and appliance operators these days, and *where are the true amateurs ? ? ?* This repeater and the other ATV repeater, (VK7RTV, which is Installed on Mount Duncan), with the exception of the receiver IF systems, are completely *home-brew*. This includes the receive converters, control systems, transmitters and all antennas.

To date, much experimental work has been carried out by the ATVers with antenna and propagation on the UHF bands.

Thanks to Tony VK7AX for supply of the ATV notes.

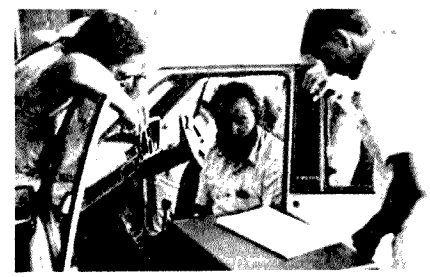
Contributed by Max Hardstaff VK7KY
ar

ORANGE AMATEUR RADIO CLUB

During December 1985, the Orange Amateur Radio Club made free checks of two-way radios which are used during bushfires. The checks were carried out by professional mechanics using the latest test equipment, under the guidance of members of WICEN.

Minor adjustments were made where required

Bob Moore VK2DSM, Vice-President of OARC, operates the Motorola Test Set.



and major problems were referred to commercial repair shops.

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29th JOTA 1986

The 29th Jamboree on the Air will be held over the weekend of 18-19th October 1986. The event will begin at 0001 hours local time on the Saturday and will end 48 hours later at 2359 hours local time on the Sunday. Stations may operate for all or any part of this period.

Participation is extremely simple:

All stations must operate strictly in accordance with their own national amateur radio regulations.

Call "CQ Jamboree" or answer any station using this call.

Any authorised frequency may be used. It is suggested that operators call, or search for stations, around the agreed world Scout frequencies listed below and that, once contact is made the operators move to another frequency to continue the contact.

Agreed World Scout Frequencies

CW: 80m — 3.590; 40m — 7.030; 20m — 14.070; 15m — 21.140; 10m — 28.190 MHz.

Phone: 80m — 3.740 and 3.940; 40m — 7.090; 20m — 14.290; 15m — 21.360; 10m — 28.990 MHz.

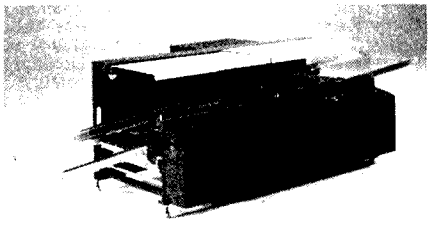
All stations are required to send in a report of activities in accordance with arrangements made by the National JOTA Organiser.

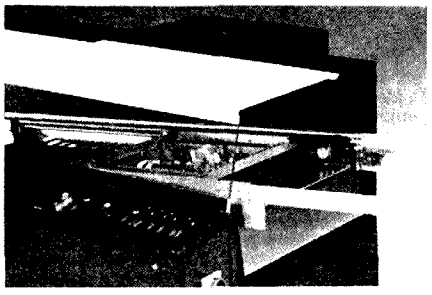
An attractive participation certificate has been designed and supplies will be sent to all National JOTA Organisers well before the event. The World Scout Bureau will also send OSL cards.

Contributed by Laszlo Nagy, Secretary General, World Organisation of the Scout Movement Organisation.

WAVE SOLDERING MACHINE

With the increased use of Surface Mount Devices (SMD) the release of the MPS-200 soldering machine from Zevatron is well timed. This unit incorporates the patented *Chip Wave* especially designed for reliable soldering of SMD devices, even when boards are very densely packed. The *Chip Wave* is a turbulent wave that is precisely modulated and is independently controllable.





The MPS-200 can be used as an ordinary machine without the additional wave being installed or, if fitted, it may be simply turned off for conventional PC board work. The machine is available with the standard working widths of 300 or 360 mm. The solder pump is made from special high-tensile titanium alloy and special steel is used for nozzles and solder channels.

The wave soldering machine can be the basic building block for an entire soldering production line as it is designed to grow with the customer's needs and become a fully automated system. Automatic replenishment of solder and flux is available and the MPS-200 series may be fitted with component insertion stations, conveyor and return conveyor belts, ascent and descent units, transverse and angular transfer units, etc, in order to optimise material and work flow.

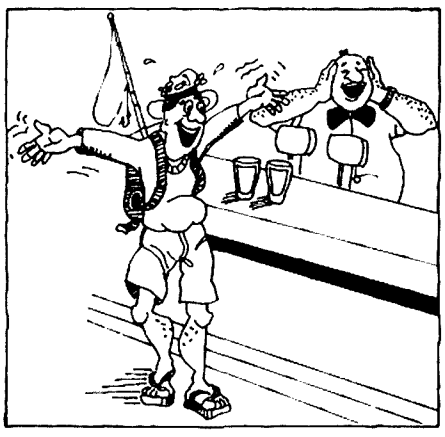
Call Alphatron on (03) 758 9000 for further information or write to 1761 Ferntree Gully Road, Ferntree Gully, Vic. 3156.

ar

HOLIDAY INN WITH TALL STORIES

The deluxe international hotel, Holiday Inn Surfers Paradise, located on the Gold Coast, will feature a public bar called *Tall Stories*.

In keeping with its name, the walls of the bar will be decorated with a selection of the tallest tall stories, plus illustrations.



A R Showcase

To locate suitable stories, a competition is being conducted whereby anyone entering a 200 to 500 word tall story has the opportunity to win a weekend for two at the facility. One weekend will be given away every month for the remainder of 1986.

Choose any topic, and write between 200 and 500 words and send your story to: Tall Stories, c/- Holiday Inn Surfers Paradise, 22 View Street, Surfers Paradise, Qld. 4217.

ar

VICOM WINS COMMUNICATIONS CONTRACT

Vicom Australia Pty Ltd, the Australian-based RF communications engineering company, has won a contract worth $A526 000 for the supply of MF and HF communications receivers to the Overseas Telecommunications Commission (Australia).

The receivers, manufactured by Dansk Radio AS of Denmark, will be remotely- controlled from OTC(A)'s receiver facility at Bringelly, NSW. OTC(A) is currently involved in a program to update its MF/HF equipment with state-of- the-art technology.

The total system comprises 24 model RX4000 receivers, 13 model RC4000 controllers, matrix switching and associated equipment, and includes specialised custom software which integrates the system to OTC(A)'s particular operating requirements.

Dansk Radio AS was founded in 1920 and has provided high quality communications equipment to over 50 countries. They have been represented in Australia and New Zealand by Vicom since 1976, during which time a large number of transmitter and receiver installations have been made.

Vicom is a fully integrated high-technology company specialising in niche electronics for government and industry.

ar

NEW MONITORING AND SURVEILLANCE SCANNER

The AOR AR-2002, a new programmable monitoring, scanning and surveillance receiver is claimed to be *above and beyond* anything previously available. Its wide frequency coverage combined with the reception modes of AM, FM (wide bandwidth) and FM (narrow bandwidth) make it ideal for *general off-air monitoring, spot frequency monitoring/measurement, selective multi-frequency analysis, spectrum surveillance, detection of innovated transmissions and general scanning.*

The AR-2002's two frequency ranges are covered in user selectable increments of 5, 12.5, and 25 kHz. A triple conversion configuration with a first IF of 750 MHz provides a typical sensitivity of 0.3 uV for 12 dB SINAD over its operating range of 25-550 and 800 to 1300 MHz.

Control of the AR-2002 can be either from a professional front panel keyboard or rotary tuning control. External control is also available via a rear panel mounted Interface socket.

Twenty internal memories are provided to the user. They can be used to store both frequency and mode information which may then be recalled manually, or automatically scanned.

The readout is a liquid crystal type indicating frequency, mode, memory channel number, frequency increment, delay on/off, channel lockout and priority operation. A bar type LED signal strength meter allows comparative measurements to be made and aids in direction finding work.

Power requirements are 12 volts DC or 240 volts AC. Antenna connection is via a rear mounted BNC connector. The size, 138W x 80H x 200D mm makes it ideal for both fixed and mobile operation.

For further details on the AR-2002 contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

ar

SCANNING RECEIVER

The Microcomm Model SX-155, a portable programmable receiver, is small, lightweight, rugged in construction, and has 160 memory channels which make it ideally suited to the tough life of professional electronics.

The 160 memory channels are divided into four groups of 40 channels, each with its own priority; ie a total of four priority channels.

Frequency coverage is 26-32, 68-88, 138-176 and 380-514 MHz with a sensitivity of less than 0.5 uV over this range. An automatic search and store function is also built-in.

Using this feature, an operator can set two frequency limits anywhere within the SX-155's range and let the radio do the rest — it will automatically look at each frequency for activity. On finding an active channel, the frequency is stored in one of the upper memories and the search resumes. If that frequency is stored on a previous search it will not be duplicated.

The unit is manufactured from tough extruded aluminium section, is powered by re-chargeable NiCAD batteries and is supplied complete with a charger, carry case and rubber antenna.

The SX-155 is available from GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777, to whom all inquiries should be directed.

ar

STRANGE BUT TRUE

A not-so-newly-licensed amateur purchased a 144 MHz Yagi antenna to replace a chimney-mounted collinear used for local FM operation: a few days later he returned to the dealer demanding his money back, saying the Yagi was a far worse performer than the collinear. The dealer was rather surprised and asked the amateur how he had installed it. It then emerged that the customer thought that *vertical polarisation* meant mounting the antenna with its boom vertical and the array pointing directly upwards . . .

From *Radio Communication*, December 1985

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

REPORT OF 1986 AGM

The Annual General Meeting of the NSW Division was held on 5th April, at Granville RSL Club. The meeting was opened at 2.12 pm by the Divisional President, Peter Jeremy VK2PJ. The Returning Officer, Robert Dolphin VK2EDR, advised that there were 622 formal votes in the ballot for the 1986 Council, and that the successful candidates were, in order of polling, Jeffrey Pages VK2BYY, Roger Henley VK2ZIG, Peter Jeremy VK2PJ, Timothy Mills VK2ZTM, Dennis Williams VK2XDW, David Horsfall VK2KFU, and Mary Jane Cant VK2CMJ. Peter O'Connell VK2EMU, was elected Returning Officer for 1986.

Under *General Business*, a motion was raised from the floor that Items 9(j) and 9(k) on the Agenda be dealt with first. This was defeated, and the meeting moved to consider Motion 9(a). A point of order was raised that this motion should have been notified as a Special Resolution and therefore could not be considered by this meeting. The Chairman accepted the point of order, following which a motion of dissent in the Chairman's ruling was moved and carried. A lengthy debate then ensued on whether or not this meeting could vote on motion 9(a), and eventually the Chairman ruled that the motion could be dealt with. Motion 9(a), *that Life Membership of the Wireless Institute of Australia, NSW Division, be conferred upon Timothy I Mills VK2ZTM*, was then put, and defeated.

Item 9(b), *that consideration be given to expanding the novice sub- band on 80 metres*, was carried.

Item 9(c), *that necessary steps be taken to review the national band plan for six metres such that Australia conforms to international practice, in both FM simplex and repeater operation*, was carried.

Item 9(d), *that the necessary steps be taken to review the national 23 cm band plan such that (a) the FM (repeater and simplex) portion conform with the international frequency segment, (b) the radar system centred on 1275 MHz be guard band protected, and (c) other changes be incorporated to further the utilisation of this band*, was carried.

Item 9(e), was withdrawn.

Item 9(f), *that the Divisional Historian, Jo Harris VK2KAA, be given a donation of $540 to help defray expenses already incurred in compiling a VK2 history, and that the Division purchase two copies of each issue of Amateur Radio for her use*, was carried.

Item 9(g), *that this meeting re-affirms that the NSW WICEN Committee is a sub-committee of the Wireless Institute of Australia NSW Division, and that in future their accounts be incorporated as part of the Divisional Accounts*, was carried.

Item 9(h) was amended to read, *that this meeting recommend to Divisional Council that one Conference of Clubs each year nominate two members who may be appointed by Divisional Council to the State Repeater Sub-committee, and that the present State Repeater Committee be disbanded*, and the amended motion was carried.

Item 9(i) was amended to read, *that time at the Annual General Meeting be allocated to allow items of general business to be discussed from the floor, and that such discussion be held after the Notices of Motion*, and the amended motion was carried.

Item 9(j), *that this meeting receive a report from Divisional Council on the case of 'Reedman vs Rockdale Council Tower Case'*, was carried. Jeff Pages VK2BYY, presented the report on behalf of Divisional Council, and this was followed by a discussion of various aspects of the case.

Item 9(k), *that the VK2 Division donate $1000 to the 'Dennis Reedman Tower Fund' or to Dennis Reedman VK2DUY directly, to help towards his personal costs of $3500 incurred in winning his appeal against Rockdale Council*, was carried.

Signed Jeff Pages VK2BYY,
VK2 Divisional Secretary.

RD CONTEST

It is about six weeks to the Remembrance Day Contest. VK2 has been the winner for the past two years but now all other States are keen to take it away from us. VK2 needs the help of all within the State to ensure that it remains for a further period in New South Wales. Try to set aside as much of the weekend as possible to enter and take part. The rules for the Contest will be found in the Contest Column in this issue.

WICEN

The Annual *City to Surf* WICEN exercise will be conducted on Sunday morning, 10th August. All amateurs in both Sydney and the surrounding areas are invited to take part. You require two metre equipment which can be used in a portable or hand-held operation. Both the weekly Divisional Broadcasts and the Thursday night (8.30 pm VK2RWS 7150) nets will carry further information.

Future WICEN exercises include the car rally at Batemans Bay in late September and the Hawkesbury River Outward Bound Canoe Classic, in late October.

SURPLUS EQUIPMENT

The list of items available from the Divisional Office as mentioned in the May Mini-Bulletin has now been replaced with a new list. If you would like a copy send a SASE to the Office at PO Box 1066, Parramatta, NSW. 2150.

75th ANNIVERSARY MEDALLIONS

The New South Wales Division awarded its allocation of medallions to the following for services to the Division and amateur radio.

Margaret and Cec Bardwell VK2IR	For the long term and continuing work with the NSW Division Correspondence Course.
Rex Black VK2YA	Founder of the (NSW) Youth Radio Scheme and the concept of its aims in training.
Pierce Healy VK2APQ	Long term service to amateur radio and his present involvement in the Museum demonstration station VK2BQK.
Keith Howard VK2AKX	Founder of and the long term work for the Westlakes Amateur Radio CLub.
Maureen Lavery	Services to the Division and its office facilities.
Henry Lundell VK2ZHE	For services to the Division for many years at the Crows Nest property in many capacities.
Jeff Pages VK2BYY	Services to VK2WI Dural and its facilities.
Bill Shakespeare VK2AGF	A foundation member of the St George Amateur Radio Society and long term service to them.
Gordon Sutherland VK2ZSG	Long term services to amateur radio in the Hunter Branch and the Hunter Region.
Athol Tilley VK2BAD	Founder of the Western Suburbs Radio Club and later the Liverpool and District Amateur Radio Club. Member of the Council for many years, including President and Secretary.
Aub Topp VK2AXT	Divisional Librarian. For services to the Division with the Parramatta facilities.
Sid Ward VK2SW	Services to the Wagga Amateur Radio Club and the Riverina amateurs for many years.
Ray Wells VK2TV	Services to the Central Coast Amateur Radio Club and the region.
Barry White VK2AAB	Long term services to amateur radio, the founder of the Hornsby and District Amateur Radio Club. Developer of the VK2RCW Morse system.
Dave Wilson VK2KDW	The convener and guidance behind the NSW Division Education Service and the production of several publications for the training of future amateurs.

The presentations of the Medallions were made either at the AGM or individually to them.

Merit Certificates were also presented to various members and a listing will appear in a later issue of the Mini-Bulletin.

NEW MEMBERS

A welcome to the following members who joined during February and March 1986.

D J S Baume VK2NDB, Narrabeen; R Bennett Assoc, Hornsby; P N L Blake VK2NDG, Beecroft; R P Buono VK2PEL, Fairy Meadow; D D Coffey Assoc, Gordon; N Cowgill VK2NEV, Eden; G F English VK2JPR, St Ives; M S Ewing VK2ERX, Epping; R A Fraser Assoc, Wilberforce; M J Grebert VK2BYG, Merewether; F F Hicks Assoc, South Cambden.

H H E Kanngieser VK2CHH, Scotland Island; E Lahodny VK2NEL, Thredbo Village; D E Law VK2AIL, Tumblong; M G Morrell Assoc, Hamilton South; W R Petrone VK2DCZ, Fairfield; R A Plater Assoc, Concord; B G Powell VK2AIZ, Arcadia; P G Vane Assoc, Dubbo; E J Virtue VK2EJV, Dunoon; H W Waugh VK2CHW, Rydalmere; J Wippo VK2AUW, Cromer.

S Wood Assoc, Hornsby Heights; R W Blake Assoc, Manyana Beach; J M Castelino Assoc, Caringbah; D A Clark VK2YDC, Balambil; W J Dowle Assoc, Manly; G B Thrum VK2CGT, Malua Bay

TOWER CASE

Following is a statement regarding the Reedman Tower Case which was agreed to following discussions between the writer and Dennis Reedman.

The case of Dennis Reedman VK2DUY versus Rockdale Municipal Council, and the involvement of the WIA NSW Division in this affair, has been the subject of some discussion and correspondence in recent months. In particular, the question of financial assistance to Dennis Reedman from the Division was raised at the 1986 Annual General Meeting and a resolution to donate $1000 towards his expenses was carried.

From what was said at the Annual General Meeting, the following further discussions between myself and Dennis, it has become apparent that, for variety of reasons, the Divisional Council of the day was not fully aware of the circumstances surrounding the case at the time that the original decision regarding financial support was made. Undoubtedly, a contributing factor here was the retirement from Council of Susan Brown in November 1984, as up until that time Susan had been acting on behalf of the Divisional Council in this matter. This change of personnel at what was a crucial time in the case, led to the misunderstanding between Dennis Reedman and Divisional Council, which subsequently developed into a standoff situation.

It would now appear that Dennis Reedman acted correctly in his dealings with Rockdale Council and the Land and Environment Court, and in view of this I have no hesitation in retracting my report on the case which was published in Amateur Radio Action, Volume 8, Issue 13, and in

particular any remarks which may have inferred that Dennis had acted improperly in any way. In fact, immediately after the Annual General Meeting, I contacted the editor of Amateur Radio Action to request that my report not be published, but by then it was too late.

With hindsight it is easy to say that the Council should have done *this*, or that Dennis should have done *that*, but what happened is now history and cannot be altered. Thankfully, this dispute is now resolved to the satisfaction of all concerned, and in particular, I would like to thank Colin Davidson for his assistance in reaching this settlement.

Signed: Jeff Pages VK2BYY,
Secretary,

NEW YORK TOWERS

Bills have been introduced in both houses of the New York state legislature relating to the construction of towers. The legislation would restrict towers to the height of the tree-line or 50 feet, whichever is lower. An exception is given to towers attached to a residence.

From *The ARRL Letter*, 9th May 1986

JOHN MOYLE FIELD DAY

A brief summary of the activities of VK1WI, during the John Moyle Field Day Contest follows.

The contest was most successful, with a large number of VK1 amateurs and their families helping to run the station, camp out in the mountains and observe Halley's Comet. A total of 554 contacts were made, including Adelaide on two metres, Sydney and Melbourne on 70 cm (perhaps by aircraft enhancement?), and a lot of fun for all involved.

We operated on all bands (except the WARC bands), from 160 metres to 70 cm. We had 23 cm equipment and antenna but never got round to firing it up. There were rigs, cables and antennas everywhere, somehow co-ordinated, in a great display of logistical supremacy, by Phil VK1PJ.

And, now for the information you are waiting for — the winner of the inaugural VK1 Favoured Club Award for the contacts on the most number of bands in the contest. The winner is:

VK2WG — Wagga Radio Club.

They worked us on seven bands — 80; 40; 15; 10; 6; 2 metres and 70 cm. They only missed out on 160 and 20 metres. Close contenders were VK3CNE (80, 40, 6 and 2 metres) and, except for no six metre openings, VK6YL (160, 80, 40 20 metres).

To those clubs who missed out — we will be there again in 1987, so with the prospect of improved conditions next year, look out for VK1WI.

ar

Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT 2606

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

ANNUAL GENERAL MEETING

At the recent AGM of the Victorian Division of the WIA the following members were elected to Council. Further appointments will be made in due course and will be announced in this column.

During the meeting, council discussed a number of new approaches which will be published next month.

COUNCIL FOR 1986

John Adcock VK3ACA; John Ambler VK3DJE; Andy Chan VK3DPJ; Des Clarke VK3DES; Jim Linton VK3PC; Alan Noble VK3BBM; Geoff Smith VK3ADB; Neville Stingel VK3CNS; Bill Wilson VK3DXE; Barry Wilton VK3XV.

OFFICE BEARERS 1986

The 1986 Office Bearers for the Victorian Division were chosen from the above and are as follows:

President and Federal Councillor: Alan Noble VK3BBM;
Vice-President and Chairman of Council: Barry Wilton VK3XV;
Secretary: Des Clarke VK3DES;
Treasurer: Lindsay Rohrlach VK3KAF;

ZONE LIAISON CO-ORDINATORS

Zones will be represented on Council by the following councillors. This means that each Zone of the Division has a voice on Council.

North-west Zone: Des Clarke VK3DES;
Midland Zone: John Adcock VK3ACA;
Eastern and East Gippsland Zone: John Ambler VK3DJE;
North-east Zone: Barry Wilton VK3XV;
Western Zone: Geoff Smith VK3ADB.

SPECIAL OFFICERS

Broadcast Chairman: David Johnson VK3YWZ;
VTAC Chairman: Peter Mill VK3ZPP;
WICEN Chairman: Leigh Baker VK3CDP;
Disposals Officer: Arthur Fraser VK3BII;
Building and Property Officer: Neville Stingel VK3CNS;
Class and Education Officer: Fred Swainston;
Intruder Watch Co-ordinator: Bill Wilson VK3DXE;
Book Sales Officer: Peter Ford VK3YTB;
Librarian and Historian: John Adcock VK3ACA.

VOTE OF THANKS

During the course of the meeting, a vote of thanks was made to Jim Linton VK3PC, for his efforts and the contribution made by him over the last three years as President of the Division.

NEW MEMBERS

During the month of April, the following new members were welcomed to the VK3 Division.

Soebijakto Adinegoro YC0BCA; Anthony Anderson VK3VBG; Emile Armanious; Leigh Baker VK3CDP; Adrian Bland; Stephen Brough VK3PIQ; M Burchadzki VK3XIP; Andrew Chantler; John Davey VK3AWX; Robert Ferguson VK3ZRF; Lorraine Gardner VK3AGO; Phillip Gledhill VK3NUE; Damian Jones VK3PJI; Dale Lemke VK3ZKO; Stephen Lemke VK3ZLR; Mark MacKenzie VK3XIU.

Rodney McNabb VK3DQJ; Malcolm McRae VK3BXJ; Walter Middleton VK3IT; B Moore; Stephen Muir; John Reardon; Glenn Rickard; Ross Taylor; John Whitehead VK3BLK; R Gower VK3DAA and Henri Lausberg VK3PHL.

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Kurt Brauer HB9AMZ; Stephen Cardwell; John Dafalias; Phillip Hardstaff VK3XGK; Charles Howes VK3NCH; William Joiner VK3PIX; Eric Lawson VK3ZAP; Leslie Pascoe; Many Petrodaskalakis; Richard Poole; Twin City Radio and Electronics Club VK2EWC and Guy Wakeham.

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QSP

AUSSAT

△ AUSSAT Pty Ltd, owner and operator of Australia's national satellite system, is calling for registrations of interest from suppliers throughout the world for the manufacture of second generation satellites, satellite control facilities and equipment.

AUSSAT's second generation system will provide replacement communication capacity for the first generation of satellites and prospectively a range of new communication and other satellite related services.

AUSSAT is aiming to issue a formal call for tenders in mid-1987, with the schedule date for mid-1988, for the finalisation of the contract.

This will enable AUSSAT to launch second generation satellites in 1991, in good time to replace the first satellites which will be nearing the end of their seven-year life.

Meanwhile a basic design concept is being developed which will include, for consideration, a number of additional; applications, such as the provision of meteorological capability, remote sensing, mobile communication services and scientific applications.

From *Telecommunication Journal*, Vol 53, IV/1986

Cartoon contributed by Rollie N7FAK via Peter Overton VK2OG.

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

CORRECTION

Please note that in the list of Divisional Councillors for 1986, Hugh Shaw VK4BHS, not only had his surname wrongly listed, but his job was also in error. Hugh is the QSL Liaison Officer, has held the post for a couple of years and does a very excellent job of sorting out the inevitable problems that arise in the QSL sphere.

BARCFEST 1986

To say that this year's event was a huge success is a gross understatement (can you have a gross understatement?). The visitors to the Indooroopilly State High School that Saturday, 10th May, were numbered in their hundreds. There were many exhibits. One in particular was a one man effort by Barry VK4ZAU, who unravelled the mysteries of satellite operation to a large number of interested amateurs. Barry's enthusiasm must surely spark a greater interest in satellite working by more VK4s. Rob VK4KUG and Michael VK4YOB, did a roaring trade in RTTY circuit boards and South East Queensland Teletype Group member subscriptions. The group were offering 20 and 25 percent discounts for de-modulator, modulator and scope PCBs for the occasion. Rob had his computer programmed to give the RTTY story on an impressive colour monitor with pages and pages of information available at the viewers choice.

Packet radio was on display and likewise, ATV.

One of the big attractions of the day was the quantity of bargains available in second hand treasure. Some top-notch items went for almost give-away prices.

Dave Prince VK4KDR spokesman for the Brisbane Amateur Radio Club and BARCfest organiser, said that this year's affair was the best ever.

SIX METRE REPEATER FOR CENTRAL QUEENSLAND

Gladstone and Rockhampton amateurs are combining in their efforts to put a six metre repeater on the air. The project is still very much in the initial stage. If the plans come to fruition by next summer, this repeater could bring many surprises at the seasonal DX peak. If, when, frequency, and location will be advised when to hand.

TOWNSVILLE DOES IT AGAIN, SO CAN YOU!

Backscatter is the official bulletin of the Townsville Amateur Radio Club. In a recent issue, Evelyn Bahr, the journal's editor, wrote this —

I guess you have all read those tales of gloom and doom about the advanced age of amateur radio operators, and the problem that may exist for our hobby in the future. I presume the homework has been carried out correctly, so what as a club can we do about it.

We can not put the clock back, but what we can do is to look to the future — and just be on hand whenever the chance turns up to influence operators. Two chances spring to mind for the TARC to do just that in the near future; ie the Fete at the Cathedral School and Entertainment in the Parks. These are both ideal locations to present amateur radio to all ages.

Even if the bands are as dead as a dodo the experienced operator has wonderful tales to tell of how and why and when some great contact was made, or the latest building project and all its possibilities.

If we have all these experienced old timers *at home, I feel it is time that we got them out and about occasionally. I think we should forget about our gray hairs and rheumatism and occupy ourselves with youth, in such schemes as the Youth Radio Scheme or School Clubs.*

Do not forget it is not only the juniors who will be learning, remember the saying By your pupils you will be taught. Life will not be dull anymore.

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

At the AGM on Tuesday, 22nd April, the following changes to the Constitution were passed.

Clause 5 now reads: *5. The Institute will be governed by a Council of ten members. Seven to be elected at the Annual General Meeting of the Institute each year as hereinafter provided. The Immediate Past President, the WICEN Director, and the Federal Councillor shall by reason of their office be members of the Council without election.*

Clause 43 now reads: *43. The Yearly Subscription for Members and Associate Members shall be such sum as may be decided upon by the Council from time to time.*

Clause 44 now reads: *44. Subject to last preceding Clause 43, the first subscription shall be payable on election and subsequent payments at 12 monthly intervals thereafter, except where payment by installment may be approved by Council.*

(See page 4 of the *April Journal* for full details).

OFFICE BEARERS

Also at the AGM, the following members were elected to Council (and positions decided subsequently):

President	Jennifer Warrington VK5ANW
Secretary	Don McDonald VK5ADD
Treasurer	Graham Ratcliff VK5AGR
Vice-President	Rowland Bruce VK5OU
Vice-President	Don McDonald VK5ADD
Membership Secretary	Ken Westerman VK5AGW
Education Officer	John Gardiner VK5PJG
DOC Liaison	Rowland Bruce VK5OU
Public Relations	Bob Allan VK5BJA
Minute Secretary	Peter Maddern VK5PRM
Alternate Federal Councillor	Don McDonald VK5ADD

It is with pleasure that we welcome new members, Bob Allan VK5BJA and Peter Maddern VK5PRM. We hope that they will enjoy their time on Council.

FAREWELL AND WELCOME

At the same time, we regretfully farewell David Clegg VK5AMK, from his position on Council. David feels that looking after ESC is enough in itself and we are pleased that he will continue in that position.

We thank you for the years you have spent on Council, David.

I am also pleased to announce that we have a new Program Organiser. Hans Van Der Zalm VK5KHZ, has very kindly volunteered to take over that position and although we have quite a few meetings booked, I am sure that Hans would be delighted to hear from anyone with suggestions for forthcoming meetings.

I would also like to *welcome aboard* the husband and wife team of Trevor Lowe VK5ZTJ, and his wife Brenda. They have volunteered to take over the Editing and Typing of the *Journal*. I understand that Trevor will do the Editing and Brenda will do the typing. Anyway, however it is done, we thank you very much.

UPDATE TO THE JUBILEE 150 AWARD LISTINGS

37	VK3CAY	45	VK2SU
38	VK2FRM	46	VK2AST
39	VK2NEV	47	VK5AQZ (2nd)
40	VK6SY	48	VK5AQZ (3rd)
41	VK4NWH	49	VK2KEW
42	VK5AS	50	L30444
43	VK2FFF	51	VK2DJJ
44	VK2CWS	52	VK4EJ

SPECIAL PREFIX

We are pleased to be able to announce that VK5 amateurs may use the *VI-prefix* from the 1st July 1986 to 31st December 1986, to celebrate our 150th year (the State of South Australia). We hope that you will all make full use of it — but please do not bother to use it if you do not intend to QSL with that prefix. Many stations in the past have been disappointed by working a special commemorative prefix, only to have the station QSL with his *ordinary* call sign. Let us keep the goodwill flowing from VK5 this year.

LIKE TO HEAR FROM ANYONE!

It has been suggested that there could be a number of retired persons who would prefer to do a Novice or Bridging Course during the daytime, instead of coming out at night. As our current instructors are all employed during the day, I wonder if there are any retired teachers, Telecom instructors, etc, who would be willing to take it on. We would like to hear from anyone who would like to be in such a course. Telephone John Gardiner VK5PJG, on 293 6076.

ANY INFORMATION?

I am trying to help the Federal Historian, Max Hull VK3ZS, to research the history of the *Greybeards*. Questions that Max would like answers to are:

a. How and when the Greybeards originated, and by whom?

b. How many Certificates were issued and to whom (list?)?

c. Was it a function of the SA Division? or

d. if it was, or is a separate entity to the WIA, is it still in existence?

Any information will be gratefully received.

DIARY DATES

July 22nd — General Meeting. Speaker, Steve Mahoney VK5AIM, on *Antenna Rotators.* Meeting begins 7.45 pm.

June 29th — Buy and Sell Night. Begins 7.30 pm.

QSL BUREAU OPERATION

Our QSL Manager, John Gough VK5QD, has had several requests to publish information on QSL procedures and the following is in answer to those requests.

Costs for outgoing QSL cards are currently five cents each with no charge for QSL cards going to other VK5 members.

Incoming cards are taken to the monthly meetings at the Burley Griffin Building, West Thebarton Road, West Thebarton, on the fourth Tuesday of each month. Those having postal accounts with the Bureau have their cards posted to them after the monthly meetings (if they have sufficient cards to warrant postage).

The following procedures operate for those using the Bureau:

Cards may be handed in at the meetings, posted or delivered to the Bureau as required. NOTE: If cards are left at the Post Office for the Bureau, postage must be paid. (There is no mail delivery at Williamstown).

Cards are to be sorted into call sign areas; eg JAs together, Ws together, etc. Also any QSL Manager to be clearly shown or the cards

could finish up in the wrong place.
*Place the Call Sign of Station Worked, on the back of the card at the top right-hand corner, together with any **VIA** information.*
Uncollected cards will be destroyed after a period of six months. Advice that cards are going to be destroyed will not be given — it will be done automatically.
Cards for countries that do not have a QSL Bureau are the members responsibility for direct QSLing. The VK5 Bureau only sends cards to other Bureaus.

Accounts may be operated by those who do not attend the meetings and can be done by depositing a sum of money with the Bureau by cheque, cash or money order. Stamped self-addressed envelopes are NOT acceptable for the despatch of cards as usually the envelopes are the wrong size or the postage is incorrect. When the account is getting low, advice will be included in with any cards being despatched. Cards will NOT be sent to accounts that are in arrears.

If you wish to collect or deliver cards direct to the Bureau, please ring first (ph: (085) 24 6171) to save a wasted trip if no one is at home.

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BEACON PLANNING

During the past year, the Federal Technical Advisory Committee (FTAC) investigated and produced *Policy Papers* on Band Planning, Packet Radio and Repeaters. This year it is *Beacons* which are to be investigated.

To date, Australia has developed and operates beacons on bands between 10 metres and 23 cm, with one on 10 GHz, in VK6 and 10 and 24 GHz being developed in VK2.

The function of a *beacon* varies depending upon the use each person makes of it. In the world of marine and aviation navigation, radio transmissions from a known position provide the bearings to calculate ones location.

To a radio amateur, a beacon provides a mixture of uses. Primarily, it is an aid to research and experimentation into the hobby. If one is local to a beacon transmission, it provides a source to check receivers and antennas against. If it is a distant transmission, then it provides an indication to the observer of a radio path between the two locations. On the microwave frequencies a beacon can often provide the only consistent signal source to enable one to become established on the band.

Australia's present beacon development can be divided into three groups:

HF, 10 metres as part of the International Beacon Project (IBP).

VHF and UHF, two and six metres, 70 and 23 centimetres, where the bands have been planned to have a beacon segment.

Microwave, a region where beacon development is only just beginning.

The program for the investigation which is to conclude at the 1987 Federal Convention is as follows:

* *submissions from interested parties to close 30th September 1986.*
* *plenary report to be published in January 1987, Amateur Radio.*
* *presentation of paper to the Federal Convention in Melbourne, May 1987.*

Amateurs who would like to provide input should register their interest by writing to the FTAC Beacon Co-ordinator, C/- PO Box 204, Willoughby, NSW. 2068.

Regular reports will appear in Amateur Radio. The next report will include discussion into the 10 metre concept — the proposed change from the present one-service-per-channel to the time-sharing by many systems of a single frequency.

Tim Mills VK2ZTM
FTAC BEACON CO-ORDINATOR

WHO CAN'T LEARN THE CODE?

Reprinted from 73 Magazine, February 1972

"I'd give anything to get an amateur licence, but I'm one of those people who just can't learn the code." It seems there are more of these unfortunates each year swirling around the fringes of amateur radio. Let me tell you how this supposed inability to absorb an elementary skill all began.

Many years ago there was no such thing as a person who couldn't learn the code. With equal enthusiasm young Johnny Ham tackled learning the code and how to build and operate his station. The required code speed in those days was only 10 words-per-minute for the General Class licence, but then the only reason the FCC has since raised it to 13 WPM, I understand, was in response to the widespread conviction that the present generation was at least 30 percent more on the ball than the preceding one.

Then along came WWII with its urgent demand for far more military CW operators than amateurs could possibly supply. The armed forces set up radio schools and one of the entrance requirements was to pass a *code aptitude* test. Fellows with recent exposure to military methods can vouch safe that even today the armed forces are not notably successful in placing men in the areas of their greatest talent and interest.

Imagine then how it was all those years ago in the hurry and confusion of an approaching war. Great numbers of would-be radio operators were told they had no code aptitude and were summarily sent off to become cooks or hospital orderlies — for which they probably had no aptitude either.

With war's end and the resumption of amateur radio it didn't take long for the military radio school drop-outs to spread the idea that many people lack the wits to learn the code. Nonsense.

Anyone who has learned that when he hears the three syllables *dou-ble- you* pronounced it represents the letter ***W*** can also learn that three other syllables, *dit-dah-dah* represent the same letter in Morse code. If one letter can be learned so can others — it's that easy. Building up speed is then a simple matter of repetition just as in any other subconscious skill, like tying your shoes, for instance.

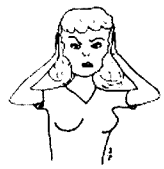
Is there a valid argument to the contrary? If there is, I've never heard of it!

Written by R B Kuehn W0HKF for 73 Magazine and contributed by Phil Connolly VK2BPC

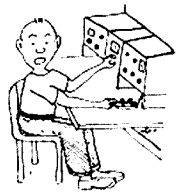
CW as seen by 73 Magazine, February 1972

Cartoons by W6EIF

The Extra Class — "Nothing to It!"

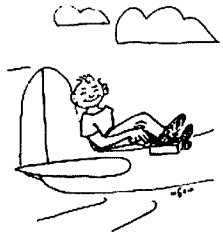


The XYL.

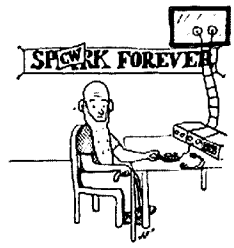


The DXer — "First we send 'DE,' then our own call.

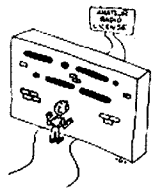
The RTTY Man — "How do you get 26 Characters from only ONE Key?"



The CW Man — "The only way to fly!"



A Typical CW Operator.



The Would-be Amateur.

The Novice — "What else is there."

WA Bulletin

Fred Parsonage VK6PF
HONORARY SECRETARY
VK6 DIVISION
PO Box 10, Perth, WA. 6005.

REPORT OF THE AGM — APRIL 1986

The Annual General Meeting, held on 15th April 1986, was held immediately following the General Meeting. It was declared by the President that there were no nominations for Council and that the existing Council had decided not to re-nominate in order to encourage new blood. This left an impasse which the President resolved by invoking the Constitution which declares that, in the event of there being no nominations for Council, the existing Council will continue until replaced. Which means that your Council is a caretaker Council until the next AGM.

Reports were given by the Officers of the QSL Bureau, the WICEN Group, the Treasurer and JOTA. Votes of thanks were given to those concerned.

The resignations were regretfully received from our two auditors, Frank VK6JK and Adrian VK6HA. A vote of thanks was proposed and passed with acclimation. Two new auditors were elected, VK6TG and VK6HM.

No general business had been notified but VK6WT was allowed to move a vote of thanks for the work by the President and Council over the past year.

VK6WZ was allowed to express regret that no reports had been received from either the Slow-Morse Co-ordinator or the Broadcast Officer. This motion was lost as it was felt that it would amount to a vote of censure. Perhaps the officers responsible would note that the AGM is the time to report and it is the opportunity to record thanks to those who are on the teams.

The Patron for 1986 was discussed and it was agreed to ask the Governor of Western Australia to continue in this role.

PRESIDENT'S REPORT by Bruce Hedland-Thomas VK6OO

If this Annual report seems short, so did the year which it describes.

MEMBERSHIP

Because at the beginning of 1985 there were still problems with the computer in the Federal Office which prevented our receiving EDP sheets, it has not been possible to compare membership numbers from one January to the next. However, we can say that there were 744 members on 17th November 1984 and 754 on 20th November 1985. A net gain of members in what are still difficult financial times is credible and is no doubt due to those members whose dedication and personal commitment is such that they uphold the Institute in on-air and off-air conversations.

A total of 64 membership certificates were issued during the year and we welcome heartily all new licensees and former members re-joining.

MEETINGS

General Meetings have continued as usual on the third Tuesday, at Science House. In 1985, they were enlivened by a door raffle whose prize was donated each month by Dick Smith Electronics. There were also occasional lectures prior to the meeting which seem to be well received. Early in 1986, Gwyn VK6AJG, offered to become Program Organiser and we have already benefitted from his work with more treats to come on an approximately bi- monthly basis.

Don Lorrimer and Mark Bastin have continued to provide our *cuppa* at meetings and the problem of lack of volunteers to stay behind and help with the washing up has been solved by going over to disposable, insulating plastic cups.

The Christmas meeting was again organised by the re-doubtable Bastin family at the Westrail Centre and was potentially the best yet. In response to suggestions, it was held on a Saturday night to allow country members to attend. This rather backfired because few country members attended and we were unaware that because of the advanced average age of radio amateurs, a goodly number are contracted to baby-sit their grandchildren on Saturday nights, thus the expected attendance numbers were not

FINANCIAL REPORT OF THE WIA (WA DIVISION) 1985

Balance sheet as at 31st December 1985.

1984		LIABILITIES	1985	
20 152.08		1. Accumulated Fund b/fwd	22 858.61	
1 123.81		2. Surplus (Trading Account)	3 501.59	
1 582.72		3. Contingency Fund Interest	2 265.50	
Net Worth =		4. Accumulated Fund c/fwd		28 625.70
	951.30	5.Subscriptions in advance	Nil	
1 409.00		6. WARC-99 Fund b/fwd	1 771.50	
362.50	1 771.50	plus this year	338.00	2 109.50
	3 333.22	7. Sundry Creditors		453.92
	Nil	8. Hugh Spence Memorial Fund		856.85
	28 914.63			32 045.97
		ASSETS		
		1. Cash		
		— Contingency Account		
		AUSCOM Transfer Account	1 738.39	
		AUSCOM 12101 @ 14.5%	12 338.00	
		AUSCOM 12363 @ 14.5%	3 864.60	
13 130.49		plus accrued interest	376.11	18 317.10
		— Trading Account		
		R & I Cheque Account	691.24	
		R & I Golden Account	2 739.77	
		AUSCOM 12154 @ 13%	4 000.00	
		plus accrued interest	686.79	8 117.80
		— Suspense Account		
		AUSCOM 12167 @ 14.5%	828.55	
		plus accrued interest	28.30	856.85
		— Floats		
		Book Shop	50.00	
		Secretary	21.88	
13 420.93	26 551.42	WICEN	100.00	171.88 27 463.63
1 295.02		2.Trading Account Stock	2 259.04	
211.10	1 083.92	less written off	49.25	2 209.79
989.34		3. Equipment b/fwd	699.94	
44.00		plus purchases	834.93	
333.40	699.94	less depreciation	190.19	1 344.68
	579.35	4. Sundry Debtors		1 027.87
	28,914.63			32 045.97

Signed: C A Bastin VK6LZ, Honorary Treasurer 7th March 1986.

We certily that we have examined the books and vouchers of the WA Division of the WIA, and have found them to be kept in a business like manner and to record the true financial position of the Division at the close of the period. We have received every assistance in the auditing of the accounts, and compliment Mr Bastin on the informative manner in which the books have been kept and the final accounts presented.

Signed: F E Taylor VK6JK
Signed: A H Van Den Avoort VK6HA
Honorary Auditors — 8th April 1986.

PROFIT & LOSS ACCOUNT — EXPENDITURE

		1. ADMINISTRATION		
288.05		— Advertising	130.22	
274.29		— Printing and Stationery	84.12	
441.00		— Insurances	441.00	
164.00		— Radio Licenses	84.00	
298.42		— Postage and Boxes	483.81	
160.25		— Phone	326.15	
433.55		— Expenses	592.55	
23.96		— Government Bank Charges	21.16	
650.00		— Rent	596.67	
75.40		— Federal Convention	23.90	
33.88	2 842.80	— Sundries	303.62	3 087.20
	138.00	2. Life Members		147.00
	115.37	3. Awards and Trophies		108.75
	1 250.00	4. Donations (Mount Barker Antenna)		95.00
1 210.00		5. Christmas Dinner	1 020.00	
1 168.00	42.00	— less receipts	766.00	254.00
	333.40	6. Equipment Depreciation		190.19
	211.10	7. Stock Written Off		49.25
1 582.72		8. Contingency Fund Interest	2 265.50	
		H Spence Memorial Interest	84.60	
362.50	1 945.22	Provision for WARC-99	338.00	2 688.10

	1 123.81	9. Surplus (Trading Account)		3 501.59	
	8 001.70			10 121.08	
		PROFIT & LOSS — INCOME			
		1. Subscriptions			
4 002.74		Received this year	3 918.71		
882.37	4 665.11	Plus in advance b/fwd	951.30		4 868.01
	20.57	2. Donations			10.00
		3. Bank Interest			
413.09		— Trading Account Received	1 058.88		
717.55		Plus accrued this year	686.79		
309.63	821.01	Less accrued last year	717.55	1 026.12	
1 535.97		— Contingency Account r'cd	2 512.69		
623.30		Plus accrued this year	376.11		
576.55	1 582.72	Less accrued last year	623.30	2 265.50	
		— Suspense Account r'cd	56.30		
		Plus accrued this year	28.30	84.60	3 376.22
		4. Sundries			
28.34		— Tea Receipts	28.07		
		— Raffles	98.76		
		— Awards	3.00		
143.47	171.81	— Radio Rally			129.83
	740.48	5. Gross Profit on Trading Account			1 737.02
	8 001.70				10 121.08

achieved. I suppose you could call it a financial failure, but a social success.

There was a Special General Meeting called during the year to discuss constitutional changes at which the members decided to permit the Vice-President to chair general meetings without the President necessarily being absent and that they did not wish to have two Vice-Presidents at this time. As a result of debate at this meeting a constitutional review sub-committee was formed. It has just reported and its recommendations will probably form the basis of a further Special General Meeting.

GENERAL

The book-shop, managed by Christine VK6ZLZ, continued as our only activity which provides a service to members and simultaneously, an income for the Division. 1985, being the WIA's 75th Anniversary Year, there was a number of special items on sale by way of being mementos of this historic occasion.

The following activities and services: *WICEN; Slow Morse; QSL Bureau; JOTA Organisation; Intruder Watch and News Broadcasts* were all carried on despite difficulties within and without and it is right to express our gratitude to the volunteers who run them.

Once again we have received cheerful co-operation and sympathetic consideration from the officers of the local Department of Communication.

Finally, as President speaking on behalf of the members, I thank the Councillors and especially Fred VK6PF for their hard-working, dedicated service.

COUNCILLORS FOR 1986

Dave Wallace VK6IW	Membership Secretary
Alyn Maschette VK6KWN	Stirrer Extra-ordinary
Cliff Bastin VK6LZ	Treasurer
Cyril Rice VK6MY	Representing PARG
Neil Penfold VK6NE	Federal Councillor
Bruce Hedland-Thomas VK6OO	President and Alternate Federal Councillor
Jill Weaver VK6YL	Representing WARG
Douglas Gordon VK6ZMG	Broadcast Officer
Christine Bastin VK6ZLZ	Book-sales Officer

CO-OPTED

Fred Parsonage VK6PF	Secretary

POSTAL ADDRESSES

WIA WA Division	QSL Bureau
PO Box 10	PO Box F319
West Perth, WA. 6005	Perth, WA. 6001
Book-sales	Broadcast
PO Box 425	PO Box 899
Cannington, WA. 6107	Fremantle, WA. 6160

TOWERS

With the present publicity regarding antenna masts and the Institute, it may be of interest to follow the case which, at the moment, is being pursued in the Division.

1. 24th September 1985 — VK6PK applied to the Shire of Wanneroo for a Building Licence to erect a 12 metre mast.
2. 14th October 1985 — Letter received from the Shire requiring the written consent of eight adjoining owners.
3. Approval was obtained from six owners and submitted to the Shire. Of the two objectors, VK6PK received less than due courtesy being ordered off one premises as *he was trespassing.*
4. *18th November 1985 — Letter received from the (now) City of Wanneroo adding another owner to the list stating "This address was omitted in error."*
5. 3rd December 1985 — Article published in local newspaper under the heading *Residents object to mast* stating incorrect facts as quoted by the two objectors.
6. 10th December 1985 — Letter published in the same newspaper from the Division refuting the article.
7. 18th December 1985 — Council meeting of the City of Wanneroo. Agenda item 11232 was passed refusing the issue of a building licence on the recommendation of the Technical Committee. This agenda item stated *"the applicant has obtained written approval from five owners and written objections from four owners."* An incorrect statement as VK6PK received written permission from six owners and verbal refusals from two. It has since been ascertained that pressure had been applied to the original approvers causing one to renege.
8. 3rd January 1986 — Letter received from the City of Wanneroo stating that a building licence had been refused together with advice that VK6PK may appeal to the Minister for Local Government.
9. An appeal was put together by the Division including copies of the Noarlunga decision and papers on masts produced by the Department of Communications. This was made to the Minister and subsequently turned down.
10. 10th April 1986 — Solicitors Gibson and Gibson were consulted by the Division who referred the matter to Denis Mcleod and Company, Barristers and Solicitors who specialise in Local Government. The following advice was obtained:

a. The Council's policy in requiring consent from all owners designated is within their power. It could be challenged as a matter of law, but this course is not recommended.

b. The addition to the list of another owner as shown in para 4 could be considered as being after normal closure of such a list and could make a good point in an appeal.

c. Recommendations:

i. Lodge a new application for a mast, this time as a Property Development. In the event of another refusal (inevitable) the applicant may take the matter to the Town Planning Appeal Tribunal where he has the right to call witnesses, present his case and cross-examine objectors and Council.

ii. Lobby Councillors to show amateur radio is a well conducted hobby and that the policy is unfair towards that section of ratepayers.

VK6PK is accepting the advice shown in 10c. i. and will be fully supported by the Division.

In the event that the Division decides to take legal help in presenting an appeal, an estimate has been given by the solicitors of between four and five thousand dollars.

The Division has now canvassed all the Councillors of the City of Wanneroo sending 11 sets of documents, followed by an additional three after local elections unseated three of the eleven. These documents included a letter explaining amateur radio and the Council policy. The Noarlunga decision which stated that amateur radio is normal use of a dwelling (not binding in WA), the Department of Communications submission on radio towers, a leaflet *Amateur Radio in WA,* the WIA handout *Amateur Radio, The Hobby for Everyone,* a letter from the Shire of Kalamunda thanking the Division for emergency support and details of the VK6PK case, asking that the Councillors support the changing of the policy. The documents were individually headed, addressed and hand-delivered to the Council Chambers on 17th April 1986, and to date (12th May), no acknowledgment of even receipt has been received from any of the Councillors!

A meetil 1986, and to date (12th May), no acknowledgment of even receipt has been received from any of the Councillors!

A meeting has been held with the City Surveyor and some of his staff and, although they were very receptive, they did nothing but reiterate the Council policy.

For all members and non-members, take heed that your hobby is in danger. regardless of how important you feel your hobby is, *No One Wants to Know,* and it is up to us all to publicise anything which can credit amateur radio or, before you know it, your local council will have your antennas down.

ar

ARRL PETITIONS FCC

The ARRL has petitioned the FCC to require the labelling of home electronic equipment relative to its susceptibility to radio-frequency interference. The petition requests that the Commission require that a tag or notice be attached to nome electronic devices or their instruction manuals to indicate whether the device incorporates shielding, filtering or circuitry designed to reduce its susceptibility to nearby radio transmitters.

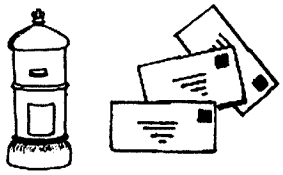
The tag or label also would warn the owner that the device may be subject to radio-frequency interference.

From *The ARRL Letter,* 9th May 1986

USA AMATEUR LICENSING as at March 1986

Taken from *The ARRL Letter,* 9th May 1986.

	1985	1986
New First Time Amateurs	*2001*	*1606*
Novice Class Upgrading	*933*	*877*
Technician Class Upgrading	*418*	*311*
General Class Upgrading	*376*	*337*
Advanced Class Upgrading	*196*	*230*
Total Amateurs Upgrading	*1923*	*1755*
Amateurs Failing to Renew	*518*	*1237*
Change in Amateur Census	*+ 1483*	*+ 439*
Month End Amateur Census	*410 775*	*420 787*
Clubs etc	*2850*	*2740*
Total Active Stations	*413 625*	*423 527*
Increase in Amateur Census		*2.39%*



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

EMERGENCY! ARE WE READY?

North America plays a vital role in Australia's amateur radio international communications emergency capability.

I would like to describe the situation so that more can join the work of the band of dedicated traffic handlers who maintain a daily international link.

The Australian Traffic Network is our equivalent to the US NTS and Canadian CTS.

Our two major links are with the International Assistance and Traffic Net (IATN) at 1100 UTC (US Summer time); 1130 UTC (US Standard time) on 14.303 MHz, directed by VE3AJN; and the Australian American Traffic Net (AATN) at 0500 UTC on 14.280 to 14.290 MHz and directed by K7OVK.

Generally one handles incoming calls and the other outgoing traffic. If any readers have any spare time at 0500 and 1100 UTC they would be welcome to check into both of these nets as liaison stations. This would help overcome the severe propagation fluctuations which cuts the traffic flow from one net for weeks at a time in some cases.

If the Mexico disaster happened tomorrow, the way the propagation is at present, we could feed traffic via the USA at 0500 UTC but out-going traffic to Australia would be extremely difficult at 1100 UTC!

Having operators who could link both the IATN and AATN together would improve US, Canada and Australian capabilities of maintaining co-ordination for the next disaster.

During Mexico, we handled 600 messages by free telephone links to US amateurs, however, if these links were not available in the next disaster, we would only be as good as our present links.

Hence, there is an urgency to improve international capabilities. Any assistance from Australian amateurs would be appreciated.

The two links, IATN and AATN, are of vital concern because Mexico demonstrated that emergency communications are best passed via North America, hence our world-wide capabilities are reflected in our links with IATN and AATN.

Links at 0430 UTC on 14.103 MHz LSB on packet radio are continuing but are not reliable due to phase distortion over the 10 000 km path, however, AMTOR mail-drop from 0600 to 0700 UTC, 7.042.5 MHz is more reliable.

I would like to establish a 7 MHz AMTOR mail-drop from 0600 to 1600 UTC, beaming to the USA. AMTOR operators can access my mail-drop using sel-call VBVS.

My eventual idea is that two 7 MHz AMTOR mail-drops, one in each country could be dedicated to incoming traffic. Hence, large quantities of incoming and out-going traffic could be handled on two frequencies during the reliable eight-hour nightly openings (no skip zone with the east and west coasts being normally heard) on 7 MHz.

Yours faithfully,

Sam Voron VK2BVS,
Co-ordinator ATN,
2 Griffith Avenue,
Roseville, NSW. 2069.
ar

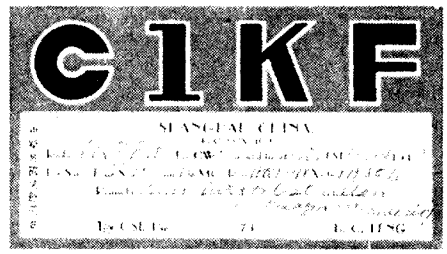
ABLE OLD MEN

I was interested to read the news, by Jim VK3PC, about BY4 Able Old Men, page 30, *Amateur Radio* for May.

In particular, he mentioned Feng C1KF which jogged my memory back to the late 1940s — to be more precise, 1947/48.

I used to work Fen and some of his countrymen quite regularly every Sunday afternoon. Some of these included Peter C1BC, Gil C1DK, Jack C1JC, Fred C1JH, Auw C3MT, Yeh C4HF, Marti W6YOT/C6, Wauh C7WW, Chang C7TY and others. (Note: These call signs are taken from my QSL card collection).

However, Feng I remember best of all and I am pleased to read that almost 40 years later, and the Revolution *to boot* that he is still active, even if not



to the same degree as of old. I wonder what has become of some of the others I have mentioned.

However, back to Feng — It was one such Sunday afternoon that I first contacted him in Shanghai. For something to say, I mentioned that I lived during the week in a block of serviced units in *Marton Hall* in Margaret Street, Sydney — my home QTH was then at St Mary's, 40 miles west of Sydney, hence my operation being mainly on Sundays when I went home to use the rig.

I mentioned to Feng that I regularly saw a compatriot of his, by the name of Hsuing, who also lived at *Marton Hall* and who had worked in the Bank of China in Sydney, but that he had recently gone home to Shanghai.

When Feng came back to me he said that he knew Hsuing and we made a sched for the following Sunday.

To my surprise when we made contact, he passed the microphone over to Hsuing, who was in Feng's shack. We chatted for some time, as one can imagine.

Now my parents lived in *Marton Hall* also, and on occasions Hsuing used to go up to their flat for a cup of coffee. Not surprisingly he asked after them and I finished the QSO thinking that it was something of a coincidence and just left it at that.

To my surprise, some months later, my mother spoke to me about the QSO. It appeared that Hsuing had forwarded some sandals to her — not one but three pairs (one large, one medium and one small size). Hsuing didn't know what size my mother took so he thought that be sending three sizes he couldn't go wrong! He didn't — the medium size fitted.

What was that ancient Chinese script on BY4AOM's card? Within four seas there are bosom friends, etc.

As a matter of Interest, these contacts were made using 50 watts AM to a full wave end fed Zep antenna on 14 MHz.

The accompanying card is my original C1KF QSL card.

73,

Allan Williams VK2FH,
20 Delecta Avenue,
Beauty Point,
Mosman, NSW. 2088.
ar

ASSISTANCE RECEIVED

I take great pleasure in writing this letter and feel I should convey my story to other amateurs.

Ever since I got my licence in 1984, I have been suffering considerable interference from a nearby cordless telephone. I believe that many others also have experienced similar problems but have never heard of an amateur who was able to resolve the problem.

After about 14 months of listening in on the conversations I decided to do something about it. I had gained all sorts of information from my monitoring, but the most valuable piece of data was the telephone number of the offending device.

I had telephoned this number and explained the problem to the owner who showed no concern that I was able to listen in on her conversations and did not intend to contact the DOC. She had obtained the telephone whilst on a holiday in Malaysia.

The interference continued.

Finally, on 6th May, I sent a letter to the DOC informing them of this interference and requesting any help or information to eliminate this problem. At 11am the following day, I received a telephone call from an officer at the DOC requesting further information. The officer was very helpful and informed me that he would advise the owner of the offending device to discount it or it would be confiscated.

Two days later I received a further call from the officer advising me that the device had been disconnected. I have suffered no further interference.

The DOC deserves applause for this excellent effort, and the speed with which it acted. Within five days of lodging my complaint the interference has ceased.

I hope that this story may help others who suffer interference on an already crowded band. It seems, however, that the DOC cannot act unless it has the telephone number or address of any interfering cordless telephone.

73,

Chris Chapman VK3VCC,
2 Ravenscourt Crescent,
Mount Eliza, Vic. 3930.
ar

WHY NOT A COMPETITION?

Keep up the new trend of more construction articles In Amateur Radio. Why not have a competition for the *best* construction article contributed?

Al Edgar VK6ZAY,
15 Gledhill Way,
Leeming, WA. 6155.
ar

PIRATING A CALL SIGN

Having just received another QSL card from a ZL for a contact I never had, plus numerous other cards I have received from amateurs and SWLs alike for QSOs I haven't had, I would like to alert readers that my call sign has now been pirated for over two years — and I am getting a little tired of it.

At my place of work there are four other amateurs who, at some time or other have also had their call signs pirated.

I am sure the amateur fraternity ar not really aware of the extent of the pirating that goes on, or don't care, unless it is their call sign that is being pirated. I read in the April issue of Amateur Radio of a VK/ZS who complained that a yacht was using his ZS call. This does not surprise me.

A close friend who is into yachting informs me that a very high percentage of ocean going yachts carry unlicensed amateur transceivers. He personally knows of three such vessels.

It is not unusual when a yacht is for sale that an amateur transceiver is part of the inventory, as essential as a depth sounder or sextant. These people are naturally going to pirate someone's call sign. Frequently when yachts reach Australian waters they use a Caribbean or Panamanian call sign.

There may be a simple way to reduce /MM pirates. Every ocean going yacht, upon entering Australia has to be cleared by Customs and immigration. When Customs go aboard searching for prohibited imports they could also look for illegal amateur transmitters. Perhaps this may be too simple. I have no answer for land-based pirates, except for very heavy fines and confiscation.

Long-time AR Member,

J Gravina VK4JS,
36 Robinson Street,
Moorooka, Qld. 4105.

RISK OF CONTROVERSY

I wish to refer to the Education Notes by the Federal Education Officer, VK3KT, in April 1986 Amateur Radio. I wish to point out that the prospective amateur is confused enough as things stand at the moment without mistakes creeping into the trial examination papers. I refer to question 4 where it is obvious to me, but perhaps not to someone else, that the symbol for volts has

been used instead ot onms. In question 17 the answer is given as (a) but in fact (c) is the correct answer. I think that if the WIA really wants more amateur operators on the air-waves and more members of the WIA, they will have to get their act together and check that all questions and answers are correct both as they arrive from the Education Officer and as typeset by the printer.

At the risk of causing further controversy, I wish also to give my thoughts on the use of the bands by the different classes of licenses. That a full call licensee use all bands as at present. A Z call to have the use, at full power, of all bands excluding the CW portions. After all he has the full theory. The novice to have the use of all bands including the CW portions at reduced power. Perhaps 10 watts on the HF bands and two watts on UHF and VHF

The K calls could still be used by those who have to up-grade their CW and would have the use of full power on voice and reduced power on CW.

I also think the time has come for the WIA to press for RTTY, Packet Radio, ASCII and other such modes of transmission to become the subject of separate exams as the field has become too broad to be covered by a single exam paper and that the use of such modes of transmission be not allowed until the amateur has sat and passed the necessary exam on the subject. In short, each exam paper should cover a smaller range of subjects in a more thorough manner.

In closing, I must ask the WIA if it has the intestinal fortitude to publish this letter in its entirety?

Yours faithfully,

Dennis Spark L60100,
PO Box 19,
Goomalling, WA. 6460.

Why not, Dennis? Many good suggestions, or at least food for thought. The problem of ambiguous exam answers (and errors) is being discussed at present; we are well aware of it. —Ed.

ar

NEW TO RADIO

I am only new to amateur radio, but I am very disappointed as when I switch on my set and hear someone talking, it takes ages for them to stop talking to give the next person a turn.

I have spoken to a few amateurs who say the same thing. To me it is something to share. Another thing is when you are in a net and you are asked a question — by the time it is your turn again you have forgotten.

I still feel that amateur radio is a wonderful hobby.

During a holiday in New South Wales a few months ago I listened to four amateurs talking and using the repeater sensibly.

Yours faithfully,

Torry Blenkiron VK5ACB,
Box 364,
Bordertown, SA. 5268.

ar

CAN'T LEARN THE CODE?

Upon reading *Over to You* in the May edition of *Amateur Radio* and noting Peter Scales VK6KHZ's remark *"I was discouraged by the CW examination"*, referring to the five words-per-minute DOC test, I couldn't help finally putting fingers to the keyboard. I might say at this point that I don't really have any particular beef with Peter's letter, as I think he found himself in a similar position to many others, but what I am about to say has been on my mind for some time now.

During the period of time that I have enjoyed the privileges of the amateur radio hobby, I have not ceased to be amazed at the number of amateurs and would-be amateurs who throw up their hands in despair at the thought of a CW test. *"The uselessness of the whole exercise; out-moded; something out of the past"*, are remarks we have all heard before, plus many others, no doubt. How difficult is it really to learn something as basic as Mr Morse's international code? Sure, at the outset of my first attempts to master the art of CW it did seem to be a daunting task, but within very short time, much to my surprise, I found that all the basic characters had been learned. This, did not at this stage put me in the box-seat for an examination pass though, as my subconscious motor skill in receiving the code had not yet developed.

How many times have you witnessed a very young child taking those first shaky steps in learning to walk? How many times have we seen a child give up and not wish to master the art of walking? It is only with great difficulty and perseverance that the youngster manages to stay upright and push forward. How many of us, who have no physical disabilities, ever thinks twice about placing one foot in front of the other when we walk down the street now? The will to succeed is the only reason we are able to walk today, that the South Pole was reached, or that Everest was conquered. May I, at this stage, say that the ability to send and receive CW at five or 10 WPM doesn't even rate with the above-mentioned ability or feats. Yes, it is that easy! If you can learn the words of a song you can learn the 26 letters and 10 numerals required to get you through the test.

If you are having difficulty in mastering the code, then almost without exception it would be right to say, you are not putting in *regular daily practice,* as this is the only requirement necessary.

Just think! If Sir Edmund Hillary had been content with the good view from half-way up Everest, he would not have had the exhilaration of standing on the summit and gaining the full perspective. Why not give it a go too, and reach for the top!

Yours faithfully,

Phil Connolly VK2BPC,
PO Box 104,
Toronto, NSW. 2283.

ar

DISCUSSION PAPER

With reference to various letters relating to the Discussion Paper, the one I must write in support of is from Gerry Preston VK5PI, regarding the Youth Radio Club Scheme which used to exist.

The voluntary one-to-one approach is very beneficial (not only in amateur radio), particularly to the young person who does not know anybody in amateur radio. He or she there-by gains a contact who is interested in their personal progress and can encourage them into the correct skills relating to operating and *building things.*

73,

Bron Brown VK3DYF,
99 Foam Street,
Rosebud, Vic. 3939.

ar

ANY INFORMATION ON A GEIGER COUNTER?

The recent nuclear disaster has once again demonstrated that amateur radio is a vital information source in time of disaster.

As I write, radio-active products are finding their way into the water supplies and food chains of the Northern Hemisphere.

A study of global wind pattern charts, which are readily available from Admiralty Chart Agencies, reveals that the mixing of Northern Hemisphere air with that of the Southern Hemisphere can easily take place at this time of year.

Australian experts have predicted, via the national press, that it will be at least a year before the fallout will be detected in this country and that it will be harmless by then.

Oh, will it now? Well, I'm not convinced. How nice it would be if I had my very own Geiger counter, so that I could decide for myself whether my tomatoes, antennas, or anything else that I may come into contact with will be better left alone for a while.

It is unlikely that this will be the last nuclear catastrophe and I would like to build a Geiger counter, just in case. *Can anyone help?*

I recall a design in a hobby magazine some years ago, however I cannot remember which one.

I have a Geiger-Muller tube — Mullard type MX 103 with four pins. Has anyone got any information on it's characteristics? Or has anyone got a Geiger Counter they would care to sell?

All letters received will be answered.

Paul Weaver VK6OF,
23 Waddell Road,
Palmyra, WA. 6157.

ar

JOHN MOYLE CONTEST

The accompanying photograph was taken during the 1986 John Moyle Memorial Field Day Contest. Participation was in the single operator CW 24 hour section using a TS-120S powered by a 12 volts lead acid accumulator which was charged by an E300 generator. The battery powered the rig, light and a fan during the hot daytime operating in the tent.

The tent, antenna (an all-band dipole supported by two gum trees), and equipment were set up at the site one hour prior to commencement of operation at 0330 UTC on Saturday, 15th March. The number of contacts worked on CW were 98.

Next year, if the solar powered rule applies, I think there will either be all solar powered stations in the field, or no entrants at all. This rule with the 10 bonus points for solar is such a handicap for conventional powered portable stations, it is impossible to be competitive. No matter how good the operator, or the efficiency of the station in the field, there is no chance of competing on an equal basis. There are just not enough stations to work.

The cost of setting up a solar unit is also beyond the financial resources of the average amateur at this time.

Yours faithfully,

Pete Alexander VK2PA,
Rollands Plains,
Via Telegraph Point, NSW. 2441.

0 ar

INTRODUCTION

This is just a few lines on my introduction to radio in a new state.

Arriving just before Christmas, my wife and I moved into our house early in January. I quickly put together the FT7 and a 21 MHz dipole, did the necessary legal work and after a short time, had the chance to *press the button.*

Very soon I made contact with a fellow ACT resident.

As I was from Queensland, I used my VK4 call sign/portable one, but something was wrong with the rig and my contact could not make sense of my transmission.

"You're a pirate, you're a pirate," he screamed.

Well! I fell off my seat. "Pirate, I'm not a pirate," I yelled at the speaker (not on air).

My friend then took stock of himself and decided to play *I spy* — press the button once for yes and twice for no, OK.

"Beep"

"Are you an amateur"

"Beep"

We then counted until we got to four using the same procedure and N for novice.

Then we had a little trouble — he wished me to send the next letter in Morse. It had been sometime since I had passed the exam and, although I find Morse fascinating, I could not think of the code.

I rushed into the lounge room to the unpacked tea chests. My wife, concerned at me casting everything all over the room, inquired the reason.

"I'm looking for a book with Morse Code in it," I yelled, "He called me a pirate."

Finally, locating the book, I rushed back to the shack. I could hear my contact saying something so I pushed the button. No reply. Later I opened the rig, moved all the PCBs, poked this and pushed that and tried again. I then had a fine contact with a Brisbane station.

The whole point was that there was something wrong with my rig. All my contact had to do was

say "There's something wrong with your transmitter, OM" and I could have gone off the air to check the fault.

If anyone else hears a strange noise on the air — it may not be pirates but some poor operator that just needs a kind word and constructive advice.

73,

Allan Stephenson VK1NUN,
100 Darwinia Terrace,
Chapman, ACT. 2611.
ar

PRACTICE DETRACTS FROM THE HOBBY

The use of commemorative call signs has recently become more frequent all over the amateur world.

I don't know whether, as an organised international body of friends, we should go into competition with the state-owned commercialised postal authorities who, by now, issue commemorative stamps on the slightest pretext.

There is, of course, nothing wrong for a radio amateur association to issue to its members, on request and on payment of a small fee, special commemorative QSL cards, to be adorned with the sender's usual call sign. This has been done, for instance, for the 1000 year anniversary of the town of Steyr, in Austria.

Special call signs and prefixes lead to difficulties in country identification, cause problems for newcomers to the DX bands and are not included in the various call books.

I feel quite strongly that this practice detracts from the basis of our hobby and should not be accepted by the world body. I don't know whether the ARRL recognises commemorative call signs for their various awards; I believe they, as well as the WIA, should refuse to accept cards with call signs other than those routinely issued.

It would be interesting to know whether other amateurs agree with my opinion.

Yours sincerely,

George Cranby VK3GI,
PO Box 22,
Woodend, Vic. 3442.
ar

PRESERVE AMATEUR TECHNIQUES

The Amateur Radio editorial of January 1986, encourages me to write about an aspect of amateur radio that has been agitating me. This concern is for all the wonderful developments and techniques that have been inspired by amateurs. We cannot retrace these developments except in museums and history books. *What about the techniques? Is there a place in amateur radio to keep these things actively alive?*

There are three distinct periods preceding the solid-state revolution:

Veteran, which includes sparks, arcs, crystal detectors and coherers.

Vintage, triodes have changed the whole concept of radio. Stout hearts toiled on to conquer MF, HF, Broadcasting, SSB, Superhets and Television. Not a bad score for 1920-1930.

Classic, the valve gained more elements, versatility, performance, frequency range and size. Crystals appeared in transmitters/receivers and there was 25 years of dizzy expansion and refinement in every aspect.

The 30 years of solid-state has left us with equipment of brilliant specification and little personal input or identification. I believe we can still demonstrate our capacity to transform bits and pieces into an effective radio system.

I suggest on odd years, a competition based on utilising past techniques. Eg Build a three-stage 25 watt transmitter and three valve receiver for 10 MHz using triodes only. Or, a triode 25 watt transmitter for 18 MHz with a six valve receiver, superhet, any valve. Or for variety, a five metre maximum vertical on 3.500 MHz, 25 watts valve transmitter, receiver optional. Again, a 25 watt FM transmitter into a four valve converter to any FM broadcast receiver or 25 watts of AM on 160 metres and the receiver a converted broadcast receiver.

The same parts can be re-used in the different rigs — versatile?

Run the contest from 1st July to 30th September. Score by the number of call districts worked and QSLed by 31st December. This is an amateurs, not an operators contest! Nostalgic — maybe; encouraging ingenuity and initiative — yes. 75 years of WIA AR has passed — let us sponsor a move to *Preserve Amateur Techniques.*

73 VK3XZ . . . - . -

Robert McGregor VK3XZ,
2 Wiltshire Drive,
Somerville, Vic. 3912.
ar

QSP

FOUR ANTENNAS

△ Four sophisticated antennas will let Intelsat VI communications satellites concentrate signals on four major population areas on Earth. The four squareax antennas used in combination represent a multitude of technology breakthroughs made possible through advanced computer-aided design/computer-aided manufacturing (CAD/CAM) techniques.

The antennas receive microwave signals from Earth and re-transmits them with pin-point precision. Without the squareax antennas, those signals would be uselessly dispersed over populated and unpopulated areas alike.

From *ITU Telecommunication Journal*, April 1986

Silent Keys

It is with deep regret we record the passing of —

MR JIM E BOISSETT VK2ETU
12th May 1986

Obituaries

ROBERT A (Bob) CROWE

The news of the untimely passing of Bob Crowe, on 16th May, was received with deep regret in the Victorian Division of the Institute.

Bob was held in high regard by all amateurs in the State for his sensitivity to their needs in his role as State Manager, Department of Communications.

At regular quarterly meetings between the Department and the Victorian Division, which he instigated, Bob was always ready with a positive attitude to ideas and requests put to him, on behalf of the amateur service, and he often made special personal efforts to ensure that approvals could be available when needed, at short notice.

His advice and guidance were well respected. Bob's interest in amateur activities was reflected in his leadership of a courteous, efficient staff and his willingness to address amateur meetings in his private time.

He will be missed by all. The Victorian Division of the WIA extends to his wife Joan, his family and friends its sincere sympathy in their loss.

Alan Noble VK3BBM.
ar

EDWARD M SIMPSON VK2ES

It was with a great sense of loss that I read (in March 1986, Amateur Radio), of the passing of Edward (Ted) Simpson BEM, on 21st June 1985.

My first meeting with Ted occurred when I was a teenager living in the eastern suburbs of Sydney, he at Bellevue Hill and I at Double Bay.

On my O-V-1, with coils wound on old valve bases, I would listen to Ted and his mate, Bruce Gillanders VK2XS, conducting their experiments with controlled carrier on Ancient Modulation, with an occasional try-out of musical numbers such as *Smoke Gets in Your Eyes* and *A Little White Gardenia*, etc.

Looking back — Hi-Fi it was not, but oh! the excitement of it all.

With some encouragement from Ted and Bruce, around 1934-35, and with a lot of help from members of the old Waverley Radio Club VK2BV, I eventually managed the AOCP in 1937. Little did I know what would be in store within a few short years.

By the end of 1939, war was brewing and in early 1940 a letter arrived, from VK2ZK asking for volunteers for a Special Wireless Group to be formed for use with the AIF.

Well, one can guess whose old familiar face came into view upon arrival at the old Seymour Army Camp in Victoria, during June 1940 — it could only be Sergeant E M Simpson.

We then formed Nos 1, 2 and 3 Wireless Telegraphy Sections (Ancient Modulation was only used sparingly).

October 1940 saw us on the high seas, sweltering in winter uniforms, in Colombo, Ceylon (now Sri Lanka), finally ending our long journey at Kilo 89 Army Camp, near Gaza, Palestine (now Israel). Here we celebrated my 21st birthday with the local brew.

By January 1941, we were taking part in the *Benghasi Derby*, overseen by a master of military matters, General Archibald Wavell, with over 40 000 prisoners taken. Our 109 sets provided communication back to Cairo, all along the Libyan Coast, past Benghasi, finally stopping at Mersa Brega/El Aghella with the 16th Brigade Infantry AIF.

Wireless vans were never popular with the forward troops because they were always obvious to field-glasses or the naked eye. *"Get out! You fellows will only draw the 'crabs' "* was the constant cry from the people at the sharp end of things.

The growing crisis in Europe drew us back to Alexandria (Ikingl Maryut Camp) in March 1941, and in what seemed the twinkling of an eye, we were pitched into the Greek Campaign, initially on Mount Olympus, commuting with the Ancient Gods of Greek Mythology, but moving forward to the Aliakmon Line as matters became serious.

It was for his outstanding performance in organising communications during the Greek Campaign that Ted received the British Empire Medal.

The same old touch was evident in his handling of our forward signals support of the 7th Division AIF elements in the Syrian Campaign.

It was obvious that we were held in high regard by the powers-that-be, considering that quite a few members had just managed to crawl out of Greece and Crete by the strangest of means in some cases.

In the Desert War, Ted would instruct his troops in the use of the *Sun Compass* and how to deal with the sandy wastes. He was indeed a man of many talents — slow, laconic, a big bony man with an all-seeing eye — but a very good boss.

Under his command, we worked with the RAF and later the RAAF (Air Support Signals), Royal Corps of Signals (Army of the Nile, 8th Army, Polish Brigade, etc), Royal Australian Armoured Corps, and various elements of Signals in the Northern Territory (NT Force).

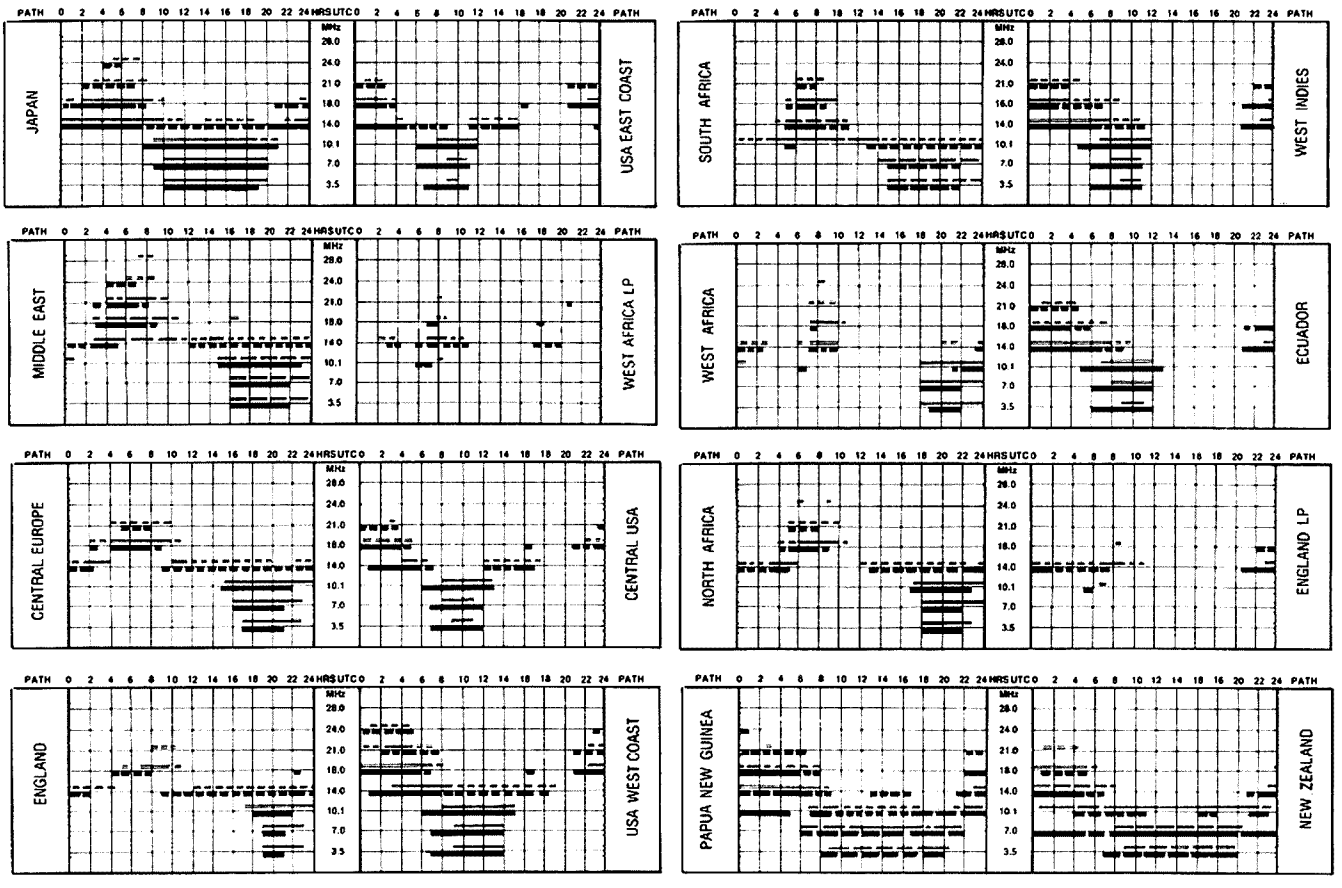
In 1944, I parted company with Ted, hearing of him only occasionally in civilian life, other activities precluding his pursuit of amateur radio.

Farewell! Edward Simpson BEM!
We can ill afford to lose such as you!

Contributed by Arthur Pearce VK2AV
ar

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic, 3060



Solar Geophysical Summary —for March

Solar activity was at low levels during March except for the period 3-5 when two energetic flares were observed. The region which produced these flares decayed as it crossed the solar disc and was without spots when it crossed the western limb on 15th March. The transit of this region produced an enhancement of the 10 cm flux early in the month peaking at 93 on the 4th and dropping to solar minimum levels after 15th and continued till the end of the month.

The 10 cm readings for the month were: 1=86; 2=89; 3=92; 4=93; 5,6=92; 7=89; 8,9=86; 10=83; 11=80; 12=78; 13=75; 14=74; 15=71; 16-18=70; 19-21=69; 22-25=70; 26=71; 27=70; 28,29=71; 30=72; 31=71. Average was 77.1 and the sunspot average was 15,7. The running yearly average was 17.1 for September 1985.

GEOMAGNETIC

March 6-8 The field became disturbed about 1030 UTC on 6th and remained at storm levels until 1500 UTC on 7th with the field generally active for the first half of the 8th. A=29, 23,19.

March 13 The field was at active levels. A=18.

March 22 The field was at active levels with brief periods of minor storm conditions. A=18.

March 24, 25 The field was at generally active levels on 24th and at minor storm levels between 0600-0900 UTC and 1500-1800 UTC on 25th. A=15, 24.

March 27 The field was at active to minor storm levels for the first half of the day. A=19.

March was a quiet month with only one day, the 6th, on which the A index exceeded 25. The extended period of disturbance expeded from 20-27 was weaker than expected and the A index only exceeded 20 on one day during this period.

From data supplied by the Department of Science IPS Radio and Space Services — March 1986.

ar

DEADLINE

All copy for inclusion in the September 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 21st July 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper; and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non- members
* Copy in typescript, or block letters — double-spaced to **Box 300, Caulfield South, Vic. 3162**
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x 220mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office ... 11 Macken Street, Oakley). ***Closed for business during July.*** Agencies at: Geoff Wood Electronics, Rozelle, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

FREE TO REPEATER GROUP

SIX CAVITY RESONATORS: of about 155 MHz working frequency, but would probably tune down to the 2m band. Size 60 cm x 10 cm diam. Weight each 5.3 kg. New owner can pay freight. **VK2AZT. Ph:(069) 42 1392.**

WANTED — NSW

BASE STATION: 2m FM transceiver. **VK2BZM. Ph:(02) 29 1768 BH or 498 2259 AH.**

CIRCULAR PANEL METER: or meter movement. FSD-30 uA, resistance 1500 ohms. Any reasonable price. Also, information on US Army Signal Corps BC-348-P radio rx, especially the Handbook of Maintenance instructions — to buy or copy. **Andrew VK2EPO, QTHR. Ph:(02)636 9310.**

TECHNICAL DETAILS: and/or circuit diagram for Pye PS728 power supply. Will cover any expenses incurred for photocopies, etc. **Gerald VK2AGS, QTHR.**

TRIANGULAR TOWER: section approx 7m high. Yaesu FT-780R 70 cm all-mode and Bencher key paddle. **Larry. Ph:(02) 949 3124.**

TRI-BAND BEAM: 3 elements or more in reasonable condition. **John VK2CJV. Ph:(02) 905024 AH or 888 9266, Ext 54 BH.**

VALVES: pair 808 valves. **VK2ZEV, QTHR. Ph:(02) 645 1078.**

WANTED — VIC

TELETYPE MODEL 15: with reperforator/counter attachment. Model 14 tape distributor. Prefer non-sync motor type. **Colin Gracie, PO, Cavendish, Vic. 3408. Ph:(055) 74 2319.**

TONO 5000E: or equivalent. **VK3CGG, QTHR. Ph:(057) 55 1124 AH.**

YAESU FTDX-100: old SSB tcvr. Not necessarily in complete working order but reasonable exterior appearance considering age. **Ian VK3AYK. Ph:(03) 523 9405.**

WANTED — QLD

COMPUTER: Tandy PC-2 Sharp 1500 with or without peripherals. Must be reasonable price. **PO Box 6051, Cairns, Qld. 4670.**

LINEAR AMPLIFIER: In very good condition. Also antenna tuner. **Lawrie VK4FJC, QTHR. Ph:(070) 65 6207.**

POWER SUPPLY: 20A, 12V power supply. AT-250 tuner, fixed xtal osc for Atlas 110, mobile mount for same. Mobile mount for TS-430. **Jim. Ph:(075) 34 3239 AH.**

WANTED — WA

TRI-BAND YAGI: TH3JR *or similar.* Also suitable rotator. All letters answered. **Cyril VK6OE, QTHR. Ph:(09) 277 0349 BH.**

YAESU FT-902: DM HF or any Yaesu/Kenwood HF tcvr with WARC bands. Reasonable price please. **Ken VK6ZA, QTHR. Ph:398 7829.**

FOR SALE — ACT

KW-2000: KW Electronics (UK) HF tcvr, 1.8-30 MHz. 6146 output. Rx OK. Tx needs overhaul. Handbook, circuit, some spare tubes. In condition as found. $150 ONO. Offers by mail or further details. **Frank VK1XE, QTHR.**

TOKYO HI-POWER 2m GaAsFET LINEAR AMPLIFIER HL 62V. Produces 40W from 2.5W input (FT-290) or 60W from 10W input. Exc con. **$195. Laurie VK1KEL, QTHR. Ph:(062) 54 2679.**

YAESU FM-107M TCVR: In-built PS supply plus all WARC bands. In immac cond. YM-35 mic, instr manual. $750 ONO, plus freight. Available mid- July. **Jock VK1LF, QTHR. Ph:(062) 88 1910 BH.**

FOR SALE — NSW

COMPUTER SYSTEM: Ferguson B/B two with two 8 inch disk drives, KBD, power supply, CPM disks, misc S/W etc. $450 ONO. IBM compatible, 640k mem, 2 disk drives, 20 Mbil hard disk, colour board, serial, parallel port, colour monitor multi-function card, Diablo 630 Daisy Wheel 40 CPS printer. $3250 ONO. Will separate. Talley dot matrix printer 9600 Baud. $200. 8 inch disk drives. SSSD. 240V 50 Hz 100.00. **Contact VK2ZPM, QTHR. Ph:(02) 629 1904.**

HUSTLER MOBILE ANTENNA SET: RM80 to 10 loading coils (5). mast, spring, mounts, etc. $150. **Roger VK2DNX, QTHR. Ph:(02) 546 1927.**

KENWOOD DG5: freq display for TS-520S, TS-520. $200 ONO. Kenwood ext VFO-520. $200 ONO. Kenwood MC-50 mic. $40. Vanco 3 pos antenna switch. $20. H/B 10.15m 4 el Yagi. $50 ONO. **I Wilkinson VK2PKB, QTHR. Ph:(049) 32 8935 after 4 pm.**

NOVICE STATION: Kenwood equipment. TS-120V tcvr, PS-20, AT- 120, VFO-120, Dynamic mic, manuals. $500 ONO. Kenwood AT-230. $150. **Allan ex-VK2VOJ, QTHR. Ph:(02) 888 3417.**

TS-180S TCVR: S/no 951746. Good cond. Manual, cartons, CW filter. No mic, no mem, no WARC. PS-30 pwr supply. S/no 1011490. Best written offer to **PO Box 40, Bombala, NSW. 2632. Peter VK8DN/2.**

UHF and VHF ANTENNAS: two 2m, 6 element Yagis. $30 ea. Two 2m, 12 element Yagis. $50 ea. Two 70 cm 17 element Yagis. $40 ea. Designed for satellite work and built to NBS specifications. Matching baluns for all. **Larry. Ph:(02) 949 3124.**

YAESU FT-101 TCVR: with mic, fan, instruction book, good order. $375. **Bruce VK2KBB, QTHR. Ph:(065) 52 2692.**

YAESU FT-101 HF TCVR: good cond with mic & manual. $400. Trio 9R-59DS rx with manual. $100. **Bob VK2VMX, QTHR. Ph:(063) 51 4217.**

YAESU FTDX-401 TCVR: very good. clean condition in going order. Full legal power, complete with desk mic & manual. Price $300. **Ph:(066) 55 6135 AH.**

YAESU FT-757GX HF TCVR: with MH1BB scanning mic. FC-757AT auto antenna tuner. FP-757 HD 20 amp cont power supply, owner and workshop manuals. Very good condition in original cartons. Suit new buyer. $1750. **Jim VK2VRT, QTHR. Ph:(043) 41 7693.**

YAESU FC-700 ANTENNA TUNER: in perfect condition, original packing. $185. Welz 2 position coaxial switch with UHF connectors, works up to 900 MHz, brand new. $30. Yaesu RSE-2A stub for 2m. $10. Yaesu RSL-3.5 80m resonator. $30. Both in exc con. **Write to VK1KEL, QTHR. Ph:(02) 817 2652.**

FOR SALE — VIC

BACK COPIES OF AR: 1968-1985 complete, except for Jan, Feb 68, Oct, Dec 71, Sept 76, Mar, Apr, May, July, Nov, Dec 81. $100 for complete set. (Will not separate). **Bruce VK3ZHI. Ph:(03) 725 7262.**

BENDIX COMPAS RX: R-101A/ARN-6 with control box & circuit diagram. C-42 FM TxRc 36-60 MHz. PSU harness, mic. Mn-26 Compas rx chassis, no box. 2 control boxes. **Ph:(052) 48 1410 AH.**

FORESTPHONE: on 1.825 MHz. $45. Pye Overland on 6m FM net (6 ch). $50. AWA 25m (SS) on 6m FM with simplex & repeater ch. $90. Dick Smith Commander 2m FM assembled & going. $180. Pye Overland on 2m FM repeater 2 (ideal shack monitor rx). $45. Pye Overland on old 6m AM net, 53.032 MHz. $45. All ONO. **Ian VK3AYK, QTHR. Ph:(03) 523 9405.**

ICOM IC-551:6m tcvr, pass band tuning plus 6/40 amplifier with power supply. Original condition complete with packaging & manual. $480. **Rod VK3DQJ, QTHR. (054) 26 1909.**

TOWER: free-standing commercial 42 feet in 3 sections. Lower section steel, upper sections special light-weight high tensile alloy. Will take large beams with high wind loading. Ex Bass Strait oil rig. Can be inspected with TH7 beam operating. Easy to erect. Will dismantle. Delivery could be arranged anywhere in Vic by negotiation. $600. **Barry Wilton VK3XV. Ph:(03) 697 4478 BH or (03) 527 4029 AH.**

YAESU FRDX-400: Amateur band rx, 160-10m plus 6 & 2m. CW1, 2, USB/LSB, AM narrow, AM wide, notch filter, noise blanker, 100 kHz/25 kHz calibrator, external VFO output for transceive, clarifier, etc. Excellent condition except for faulty LSB xtal. $150. **VK3BFG, QTHR. Ph:(03) 221 2776.**

YAESU FT-200: with FP-200 power supply. Spares. Good order. $250. **VK3VF, QTHR. Ph:(059) 75 1475.**

YAESU FT-200 TCVR: & matching FP-200 power supply. As new condition. $250. 1 kW HB linear by late Dick Pope, copy of Heath product, 2 x 572Bs. $250. RAN type PRA-1 panoramic adaptor. This is a large unit weighing 70 lbs. $65. 100TH power triodes, 4 available, 3 of which still in cartons. $25 each. **Ken Pincott VK3AFJ, QTHR. Ph:(03) 25 5775.**

FOR SALE — QLD

ICOM IC-751 HF TCVR: *Icom IC-490, 430 MHz all- mode. Icom IC-290 144-148 MHz all-mode. POA. Yaesu 144-148 MHz FM scanning tcvr with scanning mic. $300. Three VHF SRA hand-helds, have crystals for 2 channels for 2 radios. All circuits available. $180.* **Andy VK4KX. Ph:(079) 79 2161.**

KENWOOD TS-520S: 6 band HF tcvr. Can be fitted with 1 WARC band. Brand *new in box. Only $700 ONO.* **VK4JHM. Ph:(070) 91 3219.**

RTTY PC BOARDS: also drilled & assembled & tested for modulators, demodulators, monitorscopes. **XR** high speed cassette interfaces. Contact the **Secretary, SEQTG, PO Box 184, Fortitude Valley, Qld. 4006.**

WIRELESS STATION TXER C11: plus DC 24V & AC power supplies, connecting cables, junction boxes, headsets & other accessories. Was in good working condition when last used. (Military surplus item). Rhode & Scharurz WIP BN440 freq meter & sig generator. Freq range 50 kHz-30 MHz. Made in Germany. Is in good working condition. (Military surplus, is a good collectors item). For further details contact **Graeme VK4KSD, 28 Bromar Street, The Gap, Qld. 4061. Ph:(07) 300 1966.**

YAESU FT-230R: 2m, 25W FM tcvr. Full 144-148 MHz, scan, 10 memory channels, etc. Very compact unit. Ideal for mobile. VGC. $300. Will pay freight. **VK4BZB. Ph:(07) 345 8731 AH.**

FOR SALE — TAS

KENWOOD TR-8400: 70 cm mobile tcvr. As new & priced to sell at **$200. Keven VK7KV, QTHR. Ph:(002) 43 8972.**

STOLEN EQUIPMENT

The following equipment has been reported stolen at the Earlwood Police Station, by D B Watts VK2DBB.

Yaesu YM-38, Dynamic Microphone; Yaesu FT-757GX, Solid State Transceiver, Serial Number 3N040371, (call sign or name etched under one handle); and Yaesu FC-707, Antenna Tuner, Serial Number 11140775.

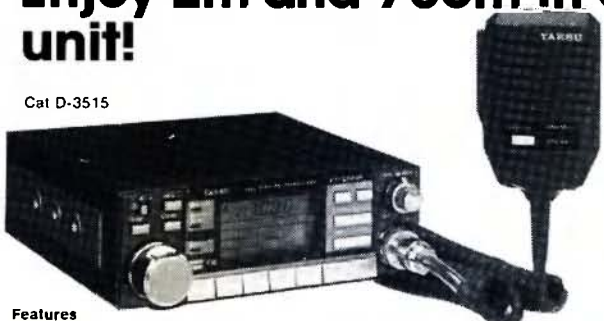
Any member with any knowledge of this equipment should contact their local police station or the VK2 Divisional Office.

Advertiser's Index

TUNE INTO VALUE!

Enjoy 2m and 70cm in one compact unit!

Cat D-3515



Amateur value that's hard to beat! Enjoy the best of both worlds (2m and 70cm) without the expense or space problems of two transceivers. Yaesu's FT-2700RH combines both bands in one unit with an impressive array of features. There's programmable scanning, 10 channel memory scan and priority too! Dual independant front ends, local synthesizers, full duplex crossbanding and much more!

Features
- 25W continuous on both bands
- Two 4-bit CPUs for complete control
- Wide angle LCD display
- Scanning mic and mobile mounting bracket

$1095

Economy 70cm Hand Held

SAVE $40!

Was $575

Yaesu FT-703R — a superb little transceiver with all the most wanted features — without the expensive frills! Covers 430-440MHz with simple thumb wheel setting. There's squelch and volume controls, repeater offset switch and high/low power control. But if that weren't enough: **• VOX (with optional YH-1 headset) • Wide operating voltages: 5.5-1.3V • 2.5W power output (10.8V FNB-3 battery included).**

Cat D-3508 **$535**

Performance 2m Mobile Action!

Now more than ever you can enjoy the open road of 2m traffic with Yaesu's FT-270RH. This feature packed compact is designed with two microprocessors for supercharged action. 10 Memories give you the channels you want at the touch of a button. Advanced scanning facilities let you tour through the band with ease. And dual VFOs let you handle the 2m pile up and win through every time.

Cat D-3517

$879

Features: **• LCD display — with backlight • Unique die-cast, duct-flow heatsink • Compact — just 140x162x40mm • High/low power output: 45/5W.**

NC-15 Quick Charger

Cradle-type charger/supply powers up FNB-3 or FNB-4 NiCads in no time: just around 3-4 hours... that's all! Features auto charge sensing. Can double as a handy base supply, too.

Cat D-3513 **$165**

~~Was $185~~

Yaesu Scan Mic

Excellent value! And so convenient too. Hand held mic suits all Yaesu transceivers with scanning facilities. Just plug in (standard 8 pin plug) and you're on the way to easy scanning operation. Perfect for mobile use. 500 ohm impedance.

Cat C-1116 **$51.50**

Maldol Duplexers Save Up To $10!

What a bargain! Maldol duplexers add versatility to communications: single transmission lines are so much more convenient!

2-6m, 50/144MHz	2m - 70cm
Cat D-3555	Cat D-3550
~~Was $62.95~~	~~Was $56.50~~
$52.95	**$49.50**
SAVE $10!	***SAVE $7!***

Value Plus! 70cm Push Button

Cat D-3509

Yaesu's FT709R — packs a load of features and performance in a compact, hand held unit! It's not weighed down with expensive extras... just the most wanted features to enjoy UHF: **• 10 Memories • 5 scanning modes: selective, priority, band, skip and busy or clear • Choice of Hi or Lo (optional) battery packs: FNB-3 (10.8V, 425mAh) or FNB- 4 (12.5V 500mAh) batteries.** Battery not inc.

$499

HF Mobile Antennas

Superb range of loaded whips from Mobile One — the Australian manufacturer that knows what you want! All feature adjustable tuning (no cutting required!) with heavy duty stainless steel stub, mobile mounting base, RG58C/U coax and PL259 connector.

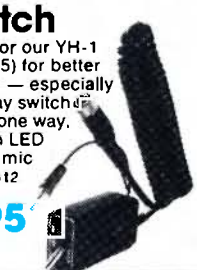
80 Metre. Cat D-4307
40 Metre. Cat D-4308
20 Metre. Cat D-4309

$59.95 each!

PTT Switch

Perfect match for our YH-1 headset (C-4195) for better communication — especially mobile! Two-way switched with locking tx one way, PTT other. With LED indicator, 7 pin mic socket. Cat D-3512

$45.95



Mobile 757 Bracket

Mount your FT-757 transceiver securely... three angle positions available; place unit in suspended or slung position. Secure either under dash or on transmission tunnel.

Cat D-2949 **$56**

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B.222/JA

New IC-R7000

Introducing a Professional Scanning Receiver at an Affordable Price.

25-1000 MHz Plus!

frequency coverage
(no additional module required for coverage to approx. 2.0 GHz.)

ICOM announce a scanning receiver that offers professional performance with IC-R7000 advanced technology – 25-1000MHz coverage, multimode operation and a sophisticated scanning and recall system.
IC-R7000 covers aircraft, marine, business, FM/AM broadcast, amateur radio, emergency services, government and television bands.

ICOM IC-R7000 has many outstanding features.

- **99 MEMORIES:** You can store up to 99 of your favourite frequencies for instant recall. Memory channels can be called up by simply pressing the memory channel knob or direct through the keyboard.
- **KEYBOARD:** Tuning can be quickly achieved by selecting precise frequencies directly through the IC-R7000 keyboard or by turning the main tuning knob.
- **SCANNINC:** instant access is provided to commonly used frequencies through the scanning system. The Auto-M switch enables signal frequencies to be memorized while the IC-R7000 is in the scanning mode. Frequencies that were in use can be recalled at the operator's convenience.
  An optional voice synthesizer automatically announces the scanned signal frequency to ease problems with logging.
- **MULTI MODE:** Push button selection enables FM wide/FM narrow/AM/SSB upper and lower modes to be received.
- **6 TUNING SPEEDS:** 0.1, 1.0, 5, 10, 12.5 and 25 kHz through knob selection.
- **ADVANCED TECHNOLOGY CONSTRUCTION:** The IC-R7000 has dual colour fluorescent display with memory channel readout and dimmer switch.
  Dial lock, noise blanker, combined S-meter and centre meter.
  Optional RC-12 infra red remote control operation. All the above professional features are produced in a convenient, compact unit of size:

Height	282mm
Width	286mm
Depth	276mm

- Specifications guaranteed from 25-1000MHz and 1260-1300MHz.
  No additional module is required for coverage to approximately 2000MHz. No coverage is available from 1000-1025MHz.

Please send me details on: ICOM 3353

☐ IC-R7000 ☐ ICOM's full range of communications equipment.

Senders details:

NAME _____

ADDRESS _____

_____ **POSTCODE** _____

PHONE: _____ **(BUSINESS)** _____ **(HOME)**

POST TO: ICOM, 7 DUKE STREET, WINDSOR, VICTORIA, 3181. PH: (03) 529 7582.

All stated specifications are approximate and subject to change witnout notice or obligation.
ICOM customers should be aware of equipment not purchased at authorized ICOM Australia Agents.
This equipment is not covered by our parts and labour warranty.

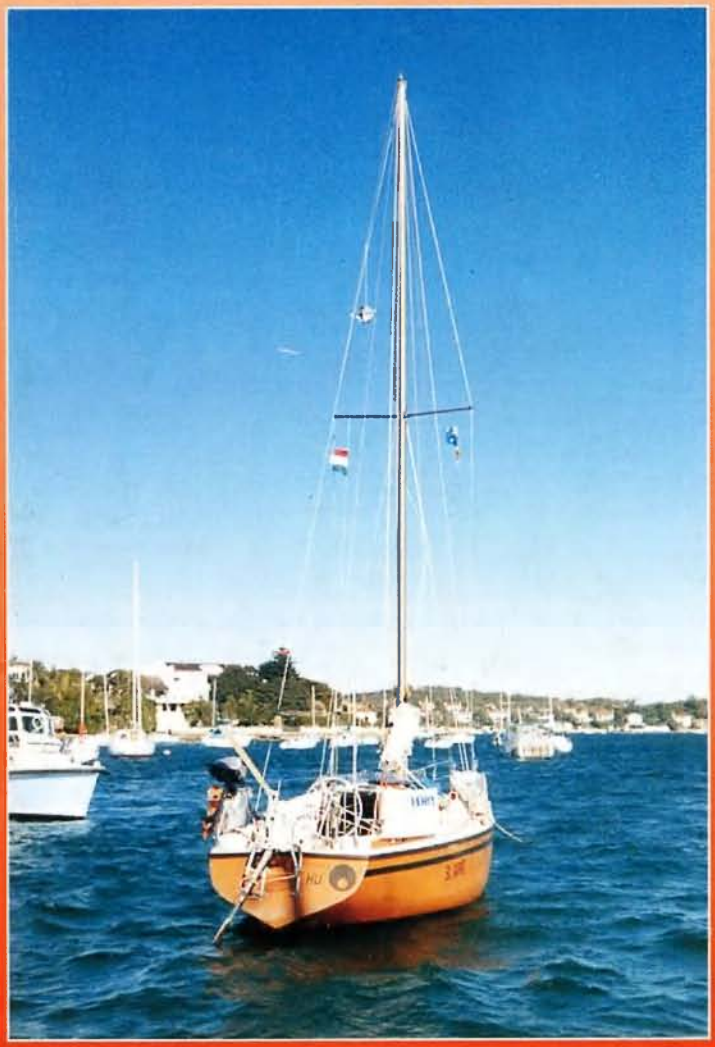
ICOM

The Frequency of Ideas.

Amateur Radio

VOL 54, No 8, AUGUST 1986

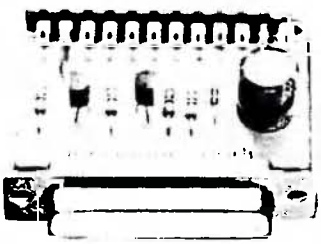
JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



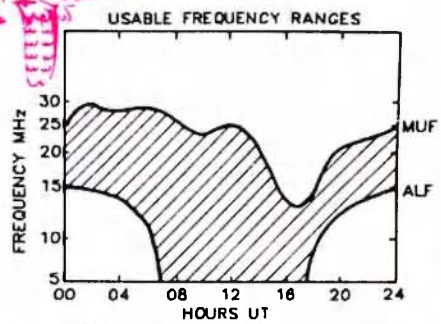
ST JUPAT arrives in Sydney
VK/ZL/OCEANIA CONTEST — 1985 results; 1986 rules
Novel Way to Learn MORSE
FIELD DAYS can be fun

The Australian Electronics Monthly

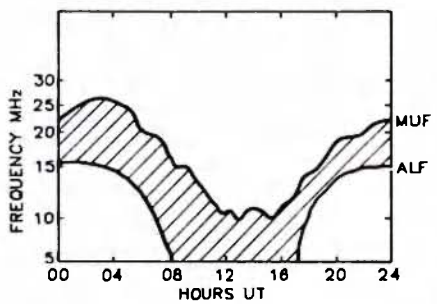
Don't miss August!



IONOSPHERIC DISTURBANCES EXPLAINED



QUIET DAY–TYPICAL CIRCUIT–SUNSPOT MAXIMUM



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ANNOUNCEMENT

Shortly, we will be making major changes to *Australian Electronics Monthly*.

In the past, electronics magazines in Australia have promised 'bigger/brighter/better' things to come, but have never quite matched the performance with the promise.

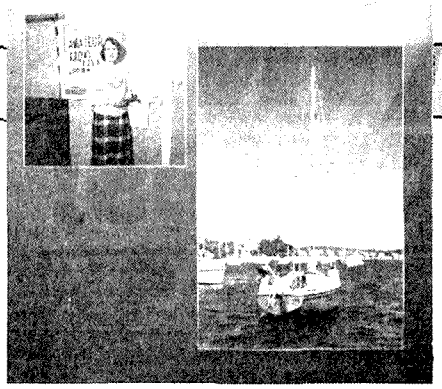
But not us.

For starters, we are going to significantly expand our project content — like *double*, would you believe?

Interested? Like to find out more?

STAY TUNED. SAME TIME, THIS MAGAZINE, NEXT MONTH

Australian Electronics Monthly is edited by Roger Harrison VK2ZTB and published by Kedhorn Holdings, Fox Valley Centre, Cnr Fox Valley Rd & Kiogle St, Wahroonga 2076 NSW.



St Jupat resting in Watson's Bay, Sydney Harbour, after a gruelling trip across the seas, see page 6.
Photograph courtesy Stephen Pall VK2PS

Jenny VK5ANW, has created many firsts for YLs in South Australia during the short time she has been an amateur, see page 3.
Photograph courtesy Peter Koen

Amateur Radio

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Technical Features

Special Features

Regular Features

Jenny VK5ANW, may be small in stature, but she is certainly a "big lady" when it comes to "rolling up the shirt sleeves" and getting things done within the VK5 Division. Jenny initially seems to start filling-in positions but before too long she is "thrown in at the deep end" and has created many firsts for YLs in South Australia.

Jenny became the first YL on Federal Council in 1981, and the first YL President of VK5 in 1986. (See page 3).

Unfortunately, due to circumstances beyond our control,there are no Ionospheric Predictions this month. Watch for Len's compilation of the predictions next month.

John VK5SJ, takes readers through the interesting and frustrating stages of setting up for, and operating in, a Field Day Contest, (page 13). Over the years, John has had some disappointments on Field Days and the lead-up to the 1986 John Moyle seemed as though it may be another one, however, despite an encounter with a rather large bull, operating in the contest proved very enjoyable and John is now contemplating next year's participation.

August certainly seems to be a contest month as Ian VK5QX, has provided the standards, Contest Disqualification Criteria, that most contest managers look for when they receive contest logs. There are rules for several interesting contests, including the 1986 VK/ZL/Oceania Contest, and the results of the 1985 VK/ZL.

Also, Ron VK1RH, has been looking at the results of the Remembrance Day Contest for the past 12 years and has drawn up some interesting comparisons over these years, in the form of graphs and tables (page 22).

And, not to be forgotten are both the results of the 1985 VK/ZL/O Contest, which was conducted by the WIA and the rules for the 1986 Contest which will be conducted by the NZART, this year.

There are so many comments written and spoken about how difficult it is to learn Morse Code. Rev VK6SA, has discovered an interesting approach to learning the characters, see page 18.

DEADLINE

All copy for inclusion in the October 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 21st August 1986.

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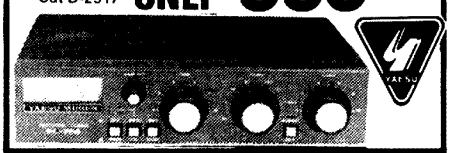
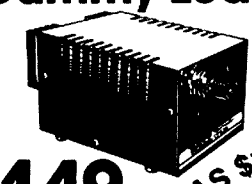


Fan Cooled Dummy Load



$149 WAS $169

100W continuous or 500W short term: that's the WELZ CT 530 Dummy Load. DC to 450MHz with SO239 socket termination and fan-forced air cooling. A must for the serious amateur.

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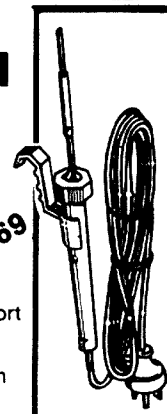
Over half off 15W iron



The perfect iron for hobbyists and enthusiasts... at an ideal price! Miniature size and lightweight. Suits soldering jobs involving semis and delicate work. Precision balanced design enables long work periods, reduces hand strain. Energy Authority approved! Cat T-1333

SAVE $8 $6.95

WAS $14.95

Economy 2m hand-held

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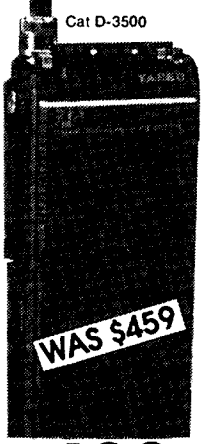

Yaesu's compact and light-weight transceiver for the amateur who doesn't need all the frills: the brilliant FT-203. Thumbwheel frequency switching makes for quick and easy channel selection — so no memories are required. But the FT-203 still packs a handy 2.5W output: more than enough for average simplex and repeater (inbuilt +/-600kHz repeater split) usage. And for mobile use the FT-203 has a no-hands VOX system when used with the optional YH-2 headset.

- **450mAh battery included**
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- **Double conversion superhet receiver, 0.25uV (12dB) sensitivity**

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$429

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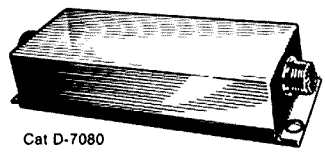

Cat D-7080

Stubborn case of TVI and BCI? Try the 'Big Gun'. Shinwa filter has helped thousands of customers. Handles up to 500 watts. Cut off is around 30MHz, insertion loss is less than 1dB and maximum attenuation is around 50dB! Ideal for amateurs and CB'ers. **$45.50**

70cm Vertical Base Antenna

Get the most from 70cm action with our latest base station antenna — from RF Aerospace, the leading manufacturer. Boasts impressive 3.2dB gain over ¼ wave whip. Wide band: 430-440MHz at <1.5:1 SWR. Compact and esy to install, comes with a mounting clamp.

Cat D-4704

JUST $59.95

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What a bargain! Maldol duplexers add versatility to communications: single transmission lines are so much more convenient!

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Cat D-3555	Cat D-3550
Was $62.95	Was $56.50
$52.95	**$49.50**

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This feature-packed compact is designed with two microprocessors for complete control. 10 memories give you the channels you want at the touch of a button. Advanced search scanning facilities let you tour through the band with ease. And dual VFO's let you handle odd repeater splits.

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Features: • LCD display — with backlight • Unique die-cast, duct-flow heatsink • Compact — just 140x162x40mm • High/low power output 25W/5W.

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B.243/MM

Thumbnail Sketches

Peter Koen
27 Hoskin Avenue, Kidman Park, SA. 5025

JENNIFER (Jenny) WARRINGTON VK5ANW

Jenny first became interested in amateur radio in 1973, when her OM, Mike attended AOCP classes and subsequently sat for and passed his limited licence in December 1974. Twelve months later he brought home a brand-new Weston 551 two-metre rig, and rashly stated that it was *her* Christmas present, so it was decided that perhaps *she* had better get her licence to go with it!

With the help of Instructors, David VK5HP and Murray VK5ZQ, she finally became licenced in December 1977, with the call sign of VK5ZBI. This was the call sign that Mike had held since 1974, but in October 1977, he had obtained his full call of VK5AMW and the Department of Communications approved the change-over of the "ZBI" call sign.

Sometime in the first half of 1975, Myrna VK5YW, had introduced Jenny to a magazine produced by *LARA (later known as ALARA*, the Australian Ladies Amateur Radio Association). Jenny became a member, and at a later date became the State Representative for VK5, a position she has held until 1983, when she became Secretary.

Around March/April 1979, Jenny was asked if she would organise the Supper, at very short notice, for the next meeting of the WIA. She was still doing this "temporary fill-in" 12 months later!

She obtained her full call in April 1980, and became VK5ANW (quickly dubbed, Australia's *Nicest Woman*!). Having been asked if she would nominate for Council, she became the first YL to be elected to the VK5 Divisional Council (also April 1980), and served the first year as the Club's and Country Members Representative (also still Supper Organiser).

In April 1981, she became the Minutes Secretary and attended the Federal Convention as Observer, with the idea that she would possibly become Federal Councillor two years hence. However, things did not go as planned and in July 1981, she became the first YL on Federal Council, as Councillor to the VK5 Division. She was still Federal Councillor and Minutes Secretary from April 1982 to 1983, and from 1983 to 1984 was Federal Councillor and Vice- President. (She also became Temporary *Five-Eighth Wave* Editor for one month in the early 80s and is still providing excellent notes of the Divisions news each month).

In April 1984, she became Secretary and Vice-President, and held both positions until April 1986, when she became the first YL to be elected President to the VK5 Division (and second in the 75 years of the WIA's history, the first being Susan Brown VK2BSB, former President of the VK2 Division).

Ask Jenny to comment on these events, and she says, "Well, I didn't 'set- out' to do any of these things, and in the beginning I was very reticent to become the first YL in these male dominated areas. I remember telling Ian Hunt VK5QX, the then President of the VK5 Division, who asked me to nominate for Council, that I didn't want to be 'just a mascot'. If I joined Council I wanted to 'pull my weight' but I was very aware of my limitations, particularly in technical areas, also, as I was breaking new ground, I was not sure of my reception by the OMs. I need not have worried, both at the Divisional and Federal levels they could not have been kinder or more considerate. And, apparently my presence did not inhibit them to any great extent. They didn't stop telling risque jokes, they merely apologised beforehand and then went on with it anyway!

"I would like to think that seeing YLs such as myself, in prominent positions, will encourage other YLs to join the hobby and to take active roles themselves. We now have, or have had, YLs on the VK2, 4, 5, and 6 Divisional Councils, and Brenda Edmonds VK3KT, as Federal Education Co- ordinator. There are also many more YLs working for the good of amateur radio in less conspicuous, but no less important positions. I hope that this trend will continue. We are never likely to 'take over' nor would we want to, but we all have talents to contribute and I thank all those OMs who had enough faith in me, to let me contribute mine."

ar

Jenny VK5ANW, accepts the "President's Gavel" from Immediate Past-President, Dick VK5ARZ, at the Burley Griffin Building, when Jenny was elected as President of the VK5 Division.

AMATEURS HONOURED

Photographs courtesy Peter Koen, Secretary, VK5BPA

Peter Koen, Secretary of VK5BPA, and John O'Dea VK5KOP, of Victor Harbour, at Government House, SA, on May 4, 1986 when both received Medals of Merit for service to Scouting from the South Australian Governor, Sir Donald Dunstan.

Editor's Comment

HAMADS

You all know the Hamads, in even smaller type *on* the back page, where providing you are an Institute member you may have up to eight lines free of charge to tell us all what you have to sell or what you want to buy.

"So what?" you say, "What is there about Hamads that makes it worth an Editorial?". I would have thought the same until a few weeks ago, when three items involving Hamads all came up at the same Publications Committee meeting. Being a person of quick wit and long experience, your worthy producer Ken said to your unworthy Editor, bereft as usual of editorial theme, "There's your next editorial; Hamads!". Or, to be more specific, he said "Why aren't people using Hamads?". Well, why aren't you?

Before you grab for pen or keyboard and dash off a fast reply, don't! Not yet, anyway. We think we know why. If you still feel impelled to make a contribution to Australia Post, read the rest and tell us if we're wrong.

One of the three items was a letter from a reader who queried the lead time of about six weeks for all AR material, including Hamads. He suggested that one week would be more sensible. Unfortunately, it just ain't so! ALL material has to go to the printer by a date (about four weeks before the magazine reaches you) which enables the printing to be costed at a concession rate. No doubt they could produce it in one week, or even less, if we paid more for the privilege! Time is money. But before it goes to the printer it must be typeset. About half a million keystrokes per issue! Two people do that job in little over a week. Sure, it could be quicker. There could be more than two, but they don't work for nothing! It's your money, folks! If you want to know more, read the article in September 1985 in which the production sequence is described.

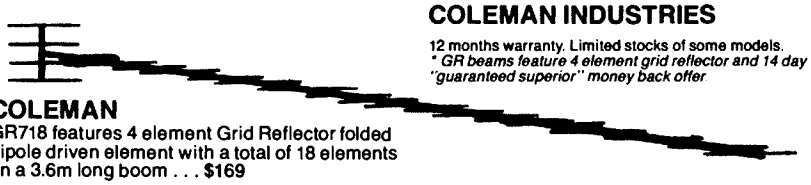
So maybe some readers with gear for sale aren't willing to wait six weeks for their ads to reach the market place. Fair enough, but where else can you advertise it for free?

Next point. We note that AR is not the only magazine in which the number of ads has dropped off over the last few years. People are simply not selling as often as they used to. Two good reasons. Due to our rather sadly diminishing dollar, new gear costs more. The obvious answer is to make do with the old for longer. And if your long suit is HF DX, there isn't a lot of it around now, right in the middle of the sunspot trough, so again why buy a new rig when it's not going to be used so much? Right?

The third item really has nothing to do with the Hamads lull, but was a suggestion that all ads for sale of equipment should carry serial numbers, which could be checked against the current list of stolen gear. But somehow we can't see thieves holding on to their "hot" equipment for six weeks, rather than trying to unload it as fast as possible. Besides, they wouldn't be WIA members, would they? Still, we are now going to put the stolen list on the same page as the Hamads, for easy reference. 73 for now.

Bill Rice VK3ABP
Editor

ANDREWS COMMUNICATIONS SYSTEMS



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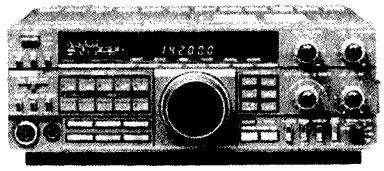
** GR beams feature 4 element grid reflector and 14 day "guaranteed superior" money back offer*

NEW COLEMAN BEAMS COMING . . .
- GR728, 28 el on 435 MHz band, etc
- GR210, 10 el on 144 MHz band, etc
- 603Y, 605Y, 606Y 52 MHz beams,

COLEMAN BEAMS NOW IN STOCK
- 2m models, 204Y . . . $29, 205Y . . . $39, 208Y . . . $59, 2011Y . . . $79. • 10m 3 el Yagi . . . $59, etc.

- KENWOOD PS.50 P/Supply $349
- WELZ SP-420 140-525 MHz, Watt-meter, 4/20/200W, SWR meter $129
- CORONA/JUMBO HP.240DX, 200W RF o/p 3-30 MHz, adj rx amp, 4 pos o/p. Compare to HL-200E and save! ..... **Only $299**



KENWOOD TS-440S . . . $1550

Includes automatic tuner, mic. Why pay $1585?
HF transceiver w/99 ch memory, 100W RF o/p, SSB-CW-AM-FM, 0.15-30 MHz rx, selectivity switch, notch, IF shift, NB, etc.
Full 12 months warranty.

- ICOM IC-R71A comms receiver $1050
- ICOM IC-PS55 P/Supply $399
- IC-R7000 scanner due now $1699
- IC-390 UHF all-mode, 10W o/p $899
- IC-AT150 auto antenna tuner $599

ICOM IC-731 . . . $1499

Includes mic. Why pay $1554?
HF transceiver w/12 ch memory, 100W RF o/p, SSB-CW-AM-FM, 0.1-30 MHz rx, PBT, notch, etc.
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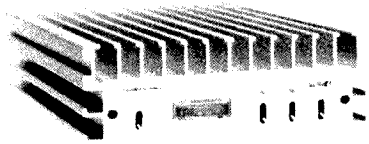
CHIRNSIDE ANTENNAS

- CHIRNSIDE CA-33 3 el tribander $369
- CHIRNSIDE CA-35DX 5 el tribander on 6m long boom, uses 2 x 10 m elements $449
- CA-5 s/s 5-band vertical, 6m long $169
- CHIRNSIDE helicals, 80-10m types ..... $39 ea
- CHIRNSIDE CA-42 15/10m Yagi $149
- RG-213 $2.50/m. RG-8/U $1.50 per metre.

Factory direct importer of high quality THP



THP HL-110V 3/10-110W 2m linear amplifier w/GaAsFET rx $599

TOKYO HY-POWER LINEARS

- HL-62V 10-60W 2m GaAsFET rx $319
- HL-160V25 25-160W 2m MOSFET rx $699
- HL-60U 10-60W UHF GaAsFET rx $499
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- HL-2K 2kW i/p, 160-10m, 2 x 3-500Zs included, WARC, 30% bigger plate xfmr $2150

Other THP Products, POA.

90 day warranty

KENPRO ROTATORS —

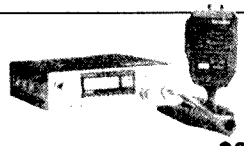
Directly imported

- *KR-600RC, 600kg/cm rotation torque $399
- KR-2000, 2000 kg/cm rotation torque $700
- *Top & bottom mast clamps inc. Control cable . ..... $2.00/m, 6 conductor.

TELEREADER CWR-880 RTTY/CW TERMINAL $579

Telereader CWR-880 allows CW/RTTY/AMTOR reception. This amazing new communications terminal features an LCD screen with 16 characters x 2 lines.

90 day warranty

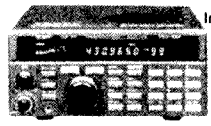


FT-270H $699 ~~$879~~

Yaesu FT-270H 2m FM features 10 ch memory, rptr, 45/5W o/p, 0.2 uV sensitivity, PMS.

FRG-8800 $950 ~~$1145~~

Yaesu FRG-8800 comms receiver allows 150 kHz to 30 MHz reception. AM/FM/SSB/CW.



Inc MMB-28 bracket

FRG-965 $899 ~~$1090~~

Yaesu FRG-965 V/UHF scanning receiver covers 60-905 MHz. AM/FM/SSB. AC/DC.

FT-726R $1699 ~~$2120~~

Yaesu FT-726(R) SSB/FM/CW, 10W o/p, AC/DC transceiver.

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Selected Kenwood items available at special prices.
Full 12 months warranty on our Yaesu, Icom and Kenwood equipment, of course.
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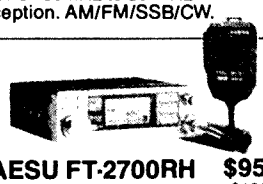

YAESU FT-2700RH $950 ~~$1095~~

Dual bander, 70cm/2m, 25W, FM, 0.2 uV, 10 ch mem, PMS.

Latest Yaesu product releases in Japan are:
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- FL-7000 HF 1 kW s/s linear
- FT-290 & -690 MKII transceivers

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Converts 0.5-60 MHz signals up to 60.5-120 MHz thereby allowing MW/SW/Low VHF reception with the FRG-965 or similar rx.

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Stephen Pall VK2PS
PO Box 93, Dural, NSW. 2158

In the March 1986 issue of *Amateur Radio* there was a report about two young Hungarian sportsmen who took on the mighty oceans is a 30 feet (9m) long, nine feet (2.5m) wide, four ton (4 tonnes) sailing boat. It is with some relief to them, their families and for those who followed their path, that on May 20, 1986 they sailed into Sydney Harbour in good health with a boat that shows the ravages of the sea.

Nandor Fa, a 32-year-old ship-builder and 30-years-old Jozsef (Joe) Gal, a mechanical engineer, left the north eastern shores of the Adriatic Sea on September 26, 1985 after they had been preparing for the round-the-world trip for five years. It was quite a unique task, as Hungary is a land-locked country in central Europe, and besides the Danube River which crosses the country from north to south, the only navigable waterway is an inland lake, the Lake Balaton which is about 80 km long and 16 km wide at some parts. With its 595 km², Lake Balaton is the largest lake in central Europe.

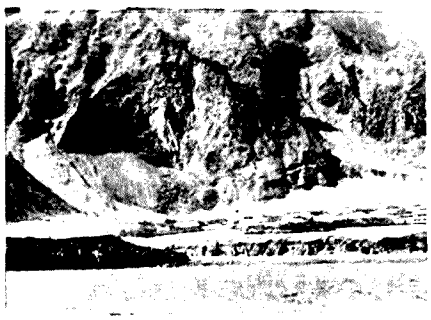
The boat, called *Saint Jupat* was named after the Hungarian patron saint of the sailing boats and kayak enthusiasts. The hull of the boat was built by the Ganz Danubius Ship Building Company, commemorating the 150th Anniversary of the Hungarian shipping industry. Nandi and Jozsef were then set the task of equipping and fitting-out the boat to their design and requirements. Out of the two would-be sailors, only Nandi had some prior sailing experience.

Once the boat was fitted out it was taken by the two adventurers on a "Shake-Down" 3200 km trip around the Adriatic Sea. Some modifications and internal re-arrangements followed this cruise. Seeing that their dream is coming to fulfillment, the two sailors started to receive some assistance from the Hungarian public and authorities, who had previously been very sceptical about the success of the venture.

Photograph contributed by Lajos Nagyvati HA5DW

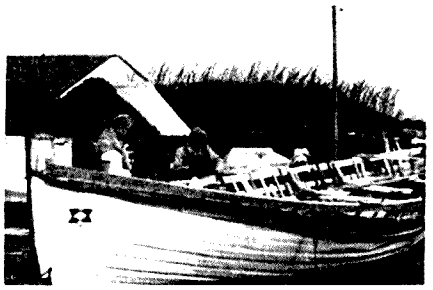
The peaks of Martin Vas Island (PY0) as seen by Jozsef and Nandi.

From Opatija, Yugoslavia in the north-eastern corner of the Adriatic Sea, they sailed for one month through the Mediterranean Sea, reached Gibraltar, replenished their food and fuel supplies and, after three days rest, sailed on to the Canary Islands. After a short stop they then sailed to the Island of Cape Verde and the Island of Tristan da Cunha, before reaching Cape Town, South Africa, on February 2, 1986.



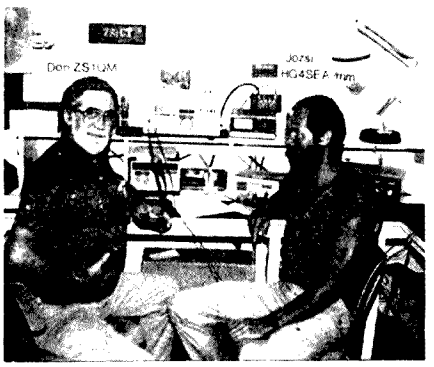
Photograph contributed by Lajos Nagyvati HA5DW

The village, which is the only settlement on Tristan da Cunha (ZD9), when the *St Jupat* arrived during their sail-boat world trip.



Photograph contributed by Lajos Nagyvati HA5DW

Nandi, the Ship Builder, visited a colleague whilst on Tristan da Cunha.



Photograph contributed by Lajos Nagyvati HA5DW

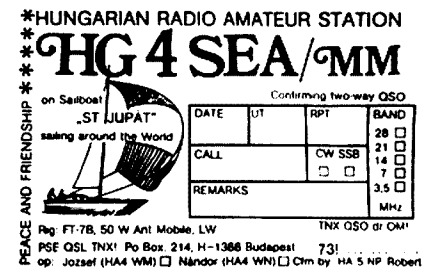
Jozsef visited the Club Station at Cape Town and had an enjoyable chat with Don ZS1QM.

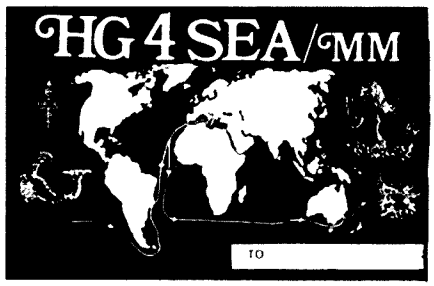
After some rest, recuperation and replenishment of necessary supplies, they sailed for Australia on March 12.

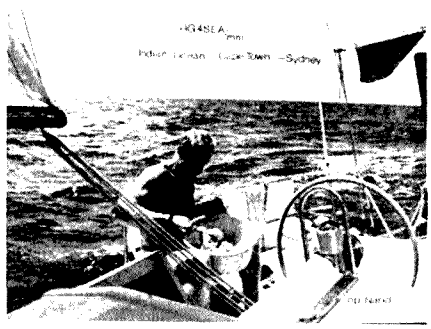
Two days later, they were struck by a severe storm and life on-board became difficult. Wet, and tired, they tried to keep the tiny boat on an even keel in mountainous seas. On March 27, the storm capsized the boat, rolling it over about 60 degrees. Completely flooded, it took several days to bail out the water and dry out the boat, added to the fact that their video, and radio equipment, and the generator were damaged. (Communications with the outside world were lost for about five days).

Before departing Hungary, both sailors had undergone an examination and tests in their sailing skills before the respective Hungarian authorities. Further study and examinations followed for them to receive their amateur radio licence and official call sign HG4SEA/MM.

On board the boat is a marine VHF radio and an FT7. When time and weather permitted regular scheds were kept on the amateur bands. With their Hungarian base station, HA4KYN, they kept







Photograph contributed by Lajos Nagyvati HA5DW

Nandi mixing the basic material for *St Jupat Bread* in the Indian Ocean between Cape Town and Sydney.

regular scheds on 3.660; 7.050; 21.260 and 14.260 MHz, time of day and propagation permitting. In the vastness of the Indian Ocean, 14.314 was their regular contact frequency. Terry ZL1MA, and in the last two weeks of their voyage, Les ZL1BIN, supplied them with regular weather reports on 14.295 MHz.

Battling huge seas, dampness, sea-water, salt, shortage of fresh food, and a very poorly functioning generator to charge their radio batteries, contact was lost with the boat for more than a week. Friends of Nandi and Jozsef in Hungary became anxious and telephone calls were made to the Hungarian community in Sydney asking for assistance. At the end of April, the New South Wales Divisional Broadcast, VK2WI appealed to amateur radio operators to keep a listening watch for them.

Eventually, faint signals were heard and reported to Mike Petery, who besides being of Hungarian origin, is a senior civilian instructor in electronics at HMAS *Nirimba* in Sydney.

On May 10, the first regular daily contacts were established between Nandi, activating HG4SEA/MM from *St Jupat*, and Roger VK2XJ, Peter VK2OG, and Steve VK2PS.

The two sailors followed the *Roaring Forties* eastward. Nearing Western Australia they were advised to avoid the Great Australian Bight and Bass Strait. They decided to go further south to the 46th latitude and sail around Tasmania. On May 10, their position was reported to Steve VK2PS as 44 degrees and 47 minutes south and 142 degrees, 38 minutes east, with strong winds of 35-40 knots. On the same evening, a successful contact was made on 7.050 MHz.

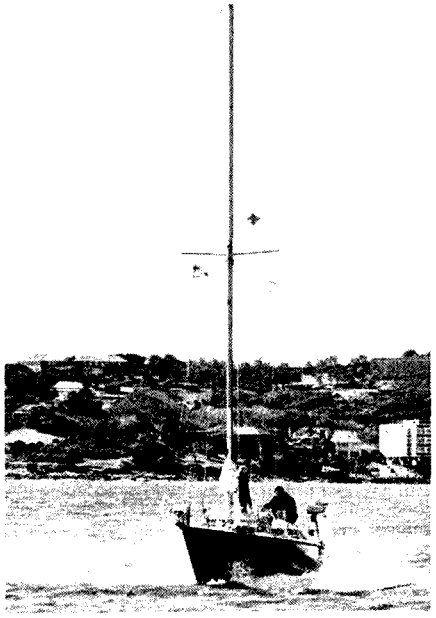
On May 16, they reported their position as 37 degrees, 44 minutes south and 151 degrees, 48 minutes east. They were also able to receive the

happy message, which was relayed to them, that Jozsef had become a father. His wife in Hungary had given birth to a healthy 3500 grams, 45 centimetre son. The two weary sailors opened a bottle of riesling wine, bought for this anticipated occasion in Cape Town, and drank a toast to the health of the newborn. (It was moving to listen to their happy voices over the crackle of the static on SSB).

By May 17, they were 36 degrees, five minutes Latitude, and travelling at an average speed of five knots per hour. That same night, the first contact was made with them on 3.630 MHz.

In the meantime, the Sydney Hungarian Community swung into action to prepare a welcome. Members of the Cruising Yacht Club of Australia were approached and landing rights and a berth were secured for the boat. An ad- hoc welcoming committee *The Friends of St Jupat* was formed.

The anticipated day of arrival was May 20, but ironically the boat made such good speed in the last days before arrival, that it arrived 20 hours early. Consequently, they had to anchor off Bondi Beach for the night as the welcoming schedule could not be altered.



***St Jupat*, after customs clearance, leaves Watsons Bay, in Sydney Harbour.**
Photograph courtesy Royal Australian Navy

Sydney Harbour was at its best on Tuesday, May 20. Bright sunshine greeted the intrepid sailors and their boat as they motored up Sydney Harbour under the guidance of the local sailing boat *Shennondoah III*, skippered by Julius Charody, a member of the CYA at Rushcutters Bay.

The wharf was crowded with media personnel, including some helicopter crews from television stations, and hundreds of members of the Hungarian community who greeted their heroes in the traditional Hungarian way — freshly baked bread, salt, wine and the sounds of Hungarian folk-music and tapping of the "Kodaly" local Hungarian dance company. Officials of the Sydney Hungarian Consulate were also present.

Welcomes were bestowed on the sailors by Julius Charody, on behalf of the yachting fraternity, Mike Petery, on behalf of the Hungarian community, Steve Pall VK2PS, on behalf of the NSW Division of the WIA, and Peter Overton VK2OG, on behalf of the Australian Navy and amateur radio operators.

On board *St Jupat*, after arrival are from left: Jozsef, Peter VK2OG and Nandor.
Photograph courtesy Royal Australian Navy

Welcome on "dry" land. From left: Mike Petery, Nandor, Mike Mercz, with violin, Jozsef, and Peter VK2OG.
Photograph courtesy Royal Australian Navy

Nandor and Jozsef anticipate staying in Sydney for a number of months so they may carry out necessary repairs and maintenance to their boat before they set-sail for New Zealand.

Around Christmas time, another dangerous part of their journey will begin when they head eastwards along the 50th southern latitude towards South America, rounding Cape Horn and landing in Buenos Aires. They then plan to sail into the Caribbean, following the eastern South American coastline, then across the Atlantic Ocean towards the port of Opatija.

Nandor and Jozsef, when asked why they were undertaking such a voyage, said: "We really do not know. Ever since we read Sir Francis Chichester's book about his solo sailing around the world, we knew we had to follow his example. No Hungarians before us, ever sailed the seas in a small boat like ours, and ours is the first Hungarian sailing boat ever to visit Australia."

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QSP

HANDS ACROSS AMERICA

On May 25, about five million citizens, co-ordinated by over 3500 radio amateurs, held hands for 15 minutes to promote public awareness of the homeless and to raise funds on their behalf.

Radio amateurs were assigned to each mile of the route and provided primary communications for the event. They reported the status of the line back to their state command posts. The state command posts were in constant contact with the east and west control stations.

The west coast control station, W6RO, was located in the berthed *Queen Mary* ocean liner, and was headed by Tim Loewenstein WA0IVW.

The east coast control station was headed by ARRL Vice-Director, Steve Mendelsohn WA2DHF

State command posts were linked to each other and the east and west command post through a tele-conferencing network, which was out together by Lou Appel K0IUQ.

From *The ARRL Letter*, June 6, 1986

JARL CODE PRACTICE

The Japan Amateur Radio League (JARL), using its station JA1RL, has started to transmit regular bulletins of interest and relevant information to its members.

This station transmits CW practice on 7.030 MHz ±5 kHz. SWL reports are solicited.

From *The ARRL Letter*, June 6, 1986

NICKEL CADMIUM BATTERIES

Nickel Cadmium Battery failures are usually classed into two major categories:

Permanent — degraded performance caused by a failure which does not permit the battery to be reconditioned electrically to an acceptable performance level.

Reversible — a normal performance level is not met but the condition can be corrected by electrically processing the unit, thus restoring the original performance level.

Permanent failures generally are caused by an internal short, open, or excessive loss of electrolyte. Although it is possible under controlled conditions to electrically remove internal short circuits, field repairs for this condition are not recommended.

Reversible failures are generally caused by repetitive use patterns on the order of repetitive depth of discharge or long periods of over-charge. This is commonly referred to as memory. Memory-effect of a NiCad battery is described as a temporary loss of capacity, or an inability to deliver the proper voltage over the normal discharge cycle. This phenomenon becomes apparent when repetitive shallow charge/discharge rate patterns are maintained. The battery become more conditioned to deliver only slightly more voltage than its previous repetitive requirements.

It is a completely reversible failure and can be erased by cycling the battery through an extended discharge period followed by a normal charge period. Discharging can be accomplished by placing a suitable load resistor across the battery positive and negative contacts. When the voltage reaches one volt/cell, remove the load and recharge the battery at the normal rate.

A fully charged standard capacity battery should discharge to one volt/cell in 60 minutes using this method. A heavy duty battery will require about 45 percent additional time to discharge. Two additional cycles will assure removal of all memory condition.

Although over-charging of NiCad batteries longer than the required charge time will not permanently harm them, a loss of capacity similar to the memory condition can occur. Due to chemical processes within the battery, the internal resistance is increased, causing the voltage to drop prematurely depending on the length of over-charge time. See Figure 2, which shows the discharge curve at the C rate and room temperature. Recovery is effected in the same manner as previously described.

From *TCA* January 1988

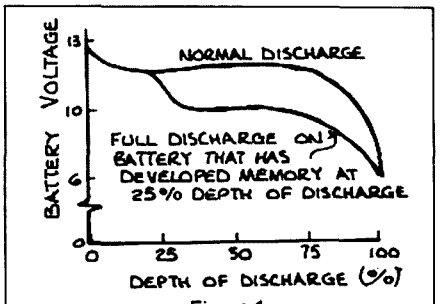


Figure 1.

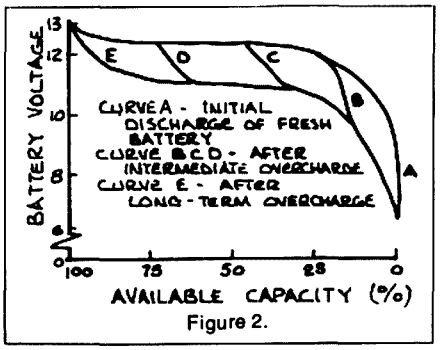


Figure 2.

EARLY RAAF TRANSMITTERS — The Type AT1

E C Roberts VK4QI
38 Bernard Street, Rockhampton North, Qld. 4701

The 500 watt RAAF Type AT1 transmitters were designed and manufactured by RAAF Signals Staff at the RAAF Station, Laverton for several years from about 1929.

Apart from valves, transformers, and meters, they were completely built by workshop personnel, including condensers, (sorry capacitors), coils, base-boards, etc.

The transmitter comprised of two polished wooden base-boards; one for the RF section and the other for the rectifier unit. A third unit was a keying and switching relay unit using two workshop manufactured brass PMG type sounder relays. One relay was the keying relay and the other switched the primary 240 volt circuit to the HT and filament transformer. This was switched on by the first touch of the key and switched off by changing the polarity of the keying voltage. Another tap on the key opened the switching relay and switched the transmitter off. (Many were the times I was zapped whilst adjusting the switching relay with one hand on each of the gap and tension adjusting screws simultaneously!).

The rectifier unit consisted of two Valve Type VU7s as a full wave rectifier. The then current RAAF nomenclature for valves was:

VT — Valve Transmitting; VR — Valve Receiving; and VU — Valve Unidirectional for rectifiers.

These VU7s were called "football" valves pertaining to their shape. They had no base and connections were made via a flying lead out of the top pinch of the valve for the anode.

Similarly, a pair of flying leads were brought out of the bottom pinch for the filament of the valve. There was definitely no need for valve connection diagrams!

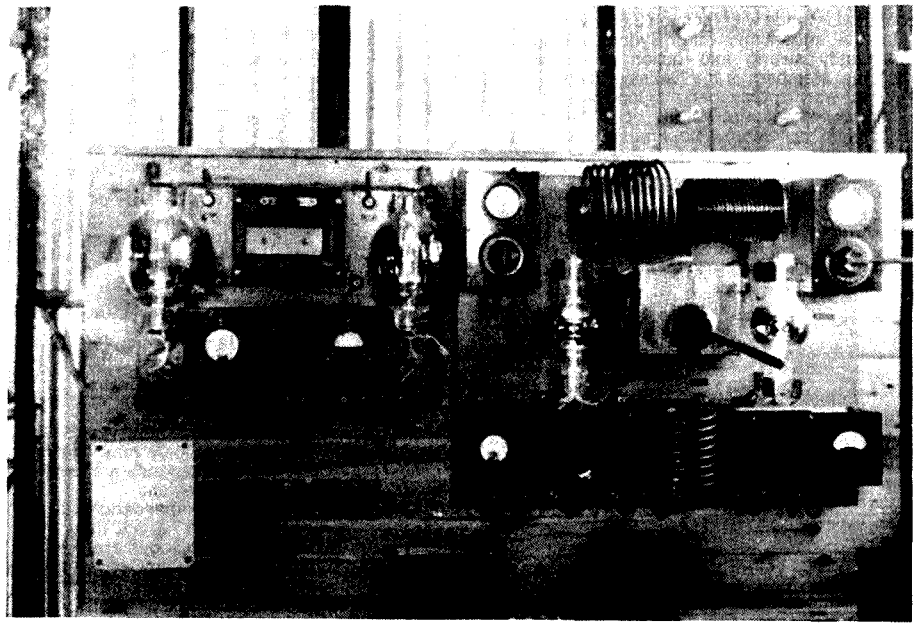
These flying leads were duly connected to screw terminals. The HT voltage from the transformer was some 3 kV and the transformer and filter condenser and choke were mounted outboard of the rectifier unit. The rectifier filaments were quick heating "bright emitter" types.

Because of this quick heating factor, the whole transmitter could be switched on remotely and ready for almost instantaneous use. This was the basis of the power switching mentioned previously and it was very effective but required periodic attention to spring tension and gap adjustment of the sounder type switching relays.

The RF section was a push-pull Tuned Anode Tuned Grid (TATG or TPTG) oscillator which was inductively coupled through series tuning condensers to an Aerial and Counterpoise. The frequency range was approximately from 2.5 to 15 Mc/s, or in modern terms MHz. This coverage was achieved by a series of plug-in coils consisting of three coils per range; one each for grid (L1), anode (L2) and aerial (L3).

The oscillator valves (in fact, the only RF valves) were VT30s and sometimes VT4s. These valves were again flying-lead types with the grid lead out of the bottom pinch on the VT30 and a screw terminal on the side of the VT4 for the grid.

Although archaic by modern standards, these transmitters gave a sterling performance carrying long distance point-to-point services throughout Australia and New Guinea, up to and after the outbreak of war in 1939. They were also used on international service until superseded and also carried the bulk of HF ground-air watches until they were eventually superseded in this service also. I believe a couple of the Darwin AT1s had a new lease of life at Batchelor, Northern Territory, for some time, but that was their last dying gasp, at least in the Northern Territory.



The Type AT1 Transmitter. The lower coil is the L1 (grid) coil; the left uppermost coil is the L2 (anode) coil, and the right-hand coil is L3, the aerial coil.

By todays standards, one would seriously question the drift and frequency stability of a transmitter which was keyed immediately at switch-on; sometimes for periods of 10 or 15 minutes non-stop in traffic. With such a relatively unstable arrangement of a self-excited oscillator direct into the aerial from a cold start, the resultant drift must have been astonishing.

However, the state-of-the-art receivers were very forgiving as their selectivity was very little better and the receiving operators were able to adjust to these variations quite easily.

When tuning the transmitter (from a tuning chart initially), there were two positions of grid tuning very close together in which the transmitter would oscillate; one much more actively than the other. It was common practice to check this by drawing an arc from the anode coil with a lead-pencil and selecting the broadest arc position for grid tuning. A few hardy (foolhardy?) souls did actually dispense with the lead-pencil and checked the arcs with a saliva covered index finger.

(I know of this as I was one of a number of operators who used this method! If the anodes had not been shunt fed, the first time would probably have been the last, or at least there would have been only one malfunction per operator and the practice would have ceased due to a shortage of operators). I do not condone the practice for anyone, at any time. Death is so permanent.

Aerial coupling was varied by altering the angular relationship between the aerial coil L3, and the anode coil, L2.

In 1940, I was employed for sometime at the old Darwin RAAF temporary transmitting station, near the Parap public school, where several AT1s were in use at the time. During the dry season the performance of these units was superb, but with the onset of the "wet" the high line surges and spikes on the local mains current, caused by severe electrical storms, caused rectifiers to arc over with resultant open circuited filaments.

All stocks of rectifiers were used and it was necessary to substitute oscillator valves by tying the grid and anode together for use as diodes. This entailed removing the porcelain beads on the VT30 grid leads and re- covering the grid leads with a rubber EHT insulator made by stripping the conductors out of lengths of EHT cable. This enabled the units and operators to "see the 'wet' out" and the rectifiers were trouble free for the following dry season.

Some of the climatic problems caused by the wet season were odd, to say the least. One morning a swarm of flying ants decided to build their nest on one of the relay units and had shed their wings with a view to taking up permanent residence there. They were brushed into a four-gallon kerosene tin and taken outside. (There were over two full tins of them).

It was a very common experience to find flying bugs of all sizes and shapes plotting a path between the plates of the anode condensers of the transmitters. This was all right until the transmitter was on and keying and then — ZAPPPP! Little bugs made little zaps and were gone but B29 size moths and Praying Mantis frequently bridged two adjacent condenser plates and the noise of their demise was indescribable!.

You could read the message being sent by the sound of the arc passing through the insects body. In this case, there was a mad dash and the ubiquitous lead-pencil soon flipped the offending insect away. Meanwhile, at the station signals office a repeat of the mangled (?) piece of text was necessary.

Reptiles visited occasionally but fortunately, very rarely did they cause any electrical problems.

During the dry season of 1940, new supplies of rectifiers were delivered and all looked rosy for the future. But the writing was on the wall for the old veteran AT1 as newer, more modern and sophisticated transmitters began arriving. With their installation the AT1 took a step back into history and the limbo of obsolete equipment in the RAAF store system after a long and meritorious service life.

INEXPENSIVE DC SUPPLY

Use a common three terminal regulator to float charge a small 12 volt battery.

Syd Cummins ZL1WT
80 Pakura Street, Te Awamutu, NZ

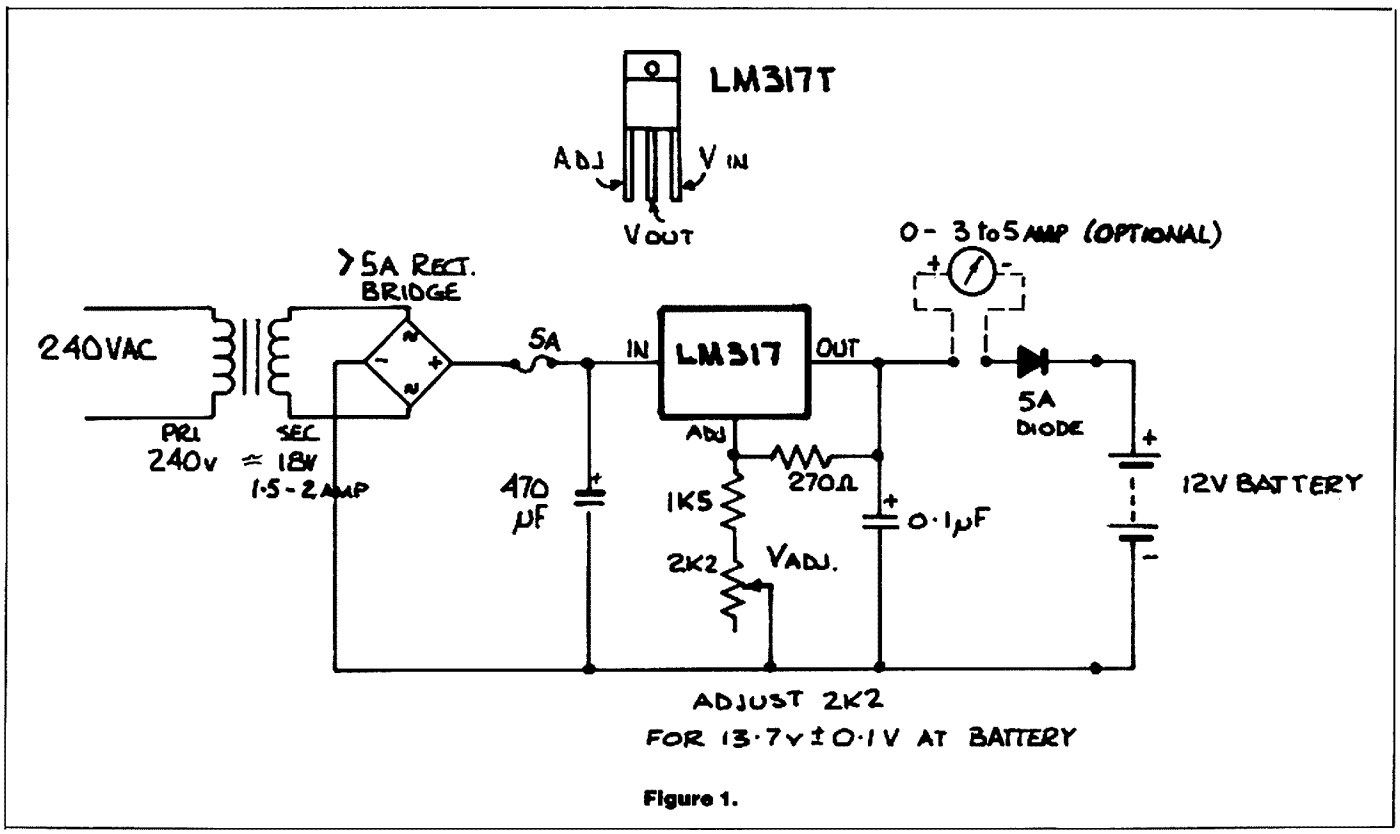


Figure 1.

Suitable high capacity DC supplies for any solid-state rig of reasonable power can be very expensive. An alternative solution to the power supply problem can be found in using a common three terminal regulator to float-charge a small 12 volt battery.

The three terminal regulator based charger operates as a straight charger when the equipment that it powers is not turned on. When the equipment is operating, the charger supplies the equipment standing currents such as the receiver current drain whilst the battery supplies peak loads such as those required during transmit. The charger capacity should therefore be equal to, or greater than, the standing (normally receiver), current drain. If this is not the case, even prolonged receive-only operation will flatten the battery.

I have developed a fully automatic charger which can charge a low cost, 12 volt motor cycle or gel battery. The preferred charging method for lead acid batteries is constant voltage charging where the current drawn by the battery decreases as it approaches full charge. The modern sealed battery is designed so that it is very difficult to damage it by over-charge (so long as the maximum voltage is not exceeded), so the charger may be left permanently connected to the battery, although continuing to attempt charging of a fully charged battery for days on end is not recommended.

The circuitry is simplicity itself. It uses an LM317 fully protected three terminal regulator which can supply a maximum charge of 1.5 amps (with suitable heat-sink). A couple of optional extras are the ammeter and the series diode in the output. The ammeter is useful in indicating the state of charge of the battery. The diode allows the charger to be turned off whilst the battery is still connected, by stopping any discharge paths back through the charger.

ZL1GM has one of these basic units in operation and claims it works perfectly.

For contest work, a larger battery may be needed to handle the possibly heavier transmit duty cycle.

In addition to its other advantages, the battery connected across the supply provides effective over-voltage protection if the regulator short circuits. The results of a failure should only be a blown fuse.

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COMIC BOOK INTRODUCES AMATEUR RADIO

A comic book introducing amateur radio to the 9-15 age group is being published by *Archie Comics*. One half of the cost of publication is being paid by the amateur radio industry, the other half by the ARRL.

The book will be 32 pages, with 24-26 pages occupying the story, the remainder will be used for an amateur radio crossword puzzle, a quiz based on the facts of the story, a glossary of terms and other fun activities.

Condensed from *The ARRL Letter*, June 6, 1986

PRIVACY ACT

On May 14, *The Electronics Communications Act of 1986*, bill was approved unanimously by the US House of Representatives Subcommittee.

The Bill proposes a new definition for the interception of radio and electronic communications — "interception of the transmission of the content" — which means that mere reception of a protected communication would be a crime.

A penalty of up to one year in jail, and up to a $10 000 fine, would be imposed for intercepting certain transmissions in the shortwave band — namely, a handful of remote broadcast pickup stations operating around 26 MHz. (Ship-to-Shore radio telephone conversations may be similarly protected, although this has not yet been clarified). Also protected would be any signal "transmitted using modulation techniques whose essential parameters have been withheld from the public with the intention of preserving the privacy of such communications." That includes scrambled and encrypted transmissions, and may include radio-teletype using bit-inversion codes as well.

Scanner owners monitoring the VHF and UHF bands will find there are penalties for tuning in the remote broadcast pickup stations around 153, 161, 450 and 455 MHz; radio common carriers around 152, 158 and 454 MHz (traditional carphones); anything scrambled or encrypted; and any FM sub-carrier service.

Abridged from *The ARRL Letter* May 23, 1986.

New IC-R7000

Introducing a Professional Scanning Receiver at an Affordable Price.

25-1000 MHz Plus!

frequency coverage
(no additional module required for coverage to approx. 2.0 GHz.)

iCOM announce a scanning receiver that offers professional performance with IC-R7000 advanced technology – 25-1000MHz coverage, multimode operation and a sophisticated scanning and recall system.
IC-R7000 covers aircraft, marine. business, FM/AM broadcast, amateur radio, emergency services, government and television bands.

iCOM IC-R7000 has many outstanding features.

- **99 MEMORIES:** You can store up to 99 of your favourite frequencies for instant recall. Memory channels can be called up by simply pressing the memory channel knob or direct through the keyboard.
- **KEYBOARD:** Tuning can be quickly achieved by selecting precise frequencies directly through the IC-R7000 keyboard or by turning the main tuning knob.
- **SCANNING:** instant access is provided to commonly used frequencies through the scanning system. The Auto-M switch enables signal frequencies to be memorized while the IC-R7000 is in the scanning mode. Frequencies that were in use can be recalled at the operator's convenience.
  An optional voice synthesizer automatically announces the scanned signal frequency to ease problems with logging.
- **MULTI MODE:** Push button selection enables FM wide/FM narrow/AM/SSB upper and lower modes to be received.
- **6 TUNING SPEEDS:** 01, 1.0, 5, 10, 12.5 and 25 kHz through knob selection.
- **ADVANCED TECHNOLOGY CONSTRUCTION:** The IC-R7000 has dual colour fluorescent display with memory channel readout and dimmer switch.
  Dial lock, noise blanker, combined S-meter and centre meter.
  Optional RC-12 infra red remote control operation. All the above professional features are produced in a convenient, compact unit of size:

Height	282mm
Width	286mm
Depth	276mm

- Specifications guaranteed from 25-1000MHz and 1260-1300MHz.
  No additional module is required for coverage to approximately 2000MHz. No coverage is available from 1000-1025MHz.

Please send me details on: ICOM3353

☐ IC-R7000 ☐ ICOM's full range of communications equipment.

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ICOM
The Frequency of Ideas.

ANTENNA ARRAYS

Part I — Theory and Equations

Paul McMahon VK3DIP
47 Park Avenue, Wattle Glen, Vic. 3350

Antennas are undoubtedly an interesting area for experimentation in amateur radio. Here we have a theoretical look at different antennas.

Antennas have always been one of the most interesting areas for experimentation in amateur radio. Few amateurs however, use a theoretical basis for their investigations, preferring instead to use the *let's build it and see* approach. Whilst this approach is equally valid, it does take quite some time and there is no guarantee that it will produce results. In fact, since the wide dissemination of the NBS Yagi designs, most construction has been simply the scaling of these designs to new frequencies. The prevailing feeling seems to be that — *all the work on antennas has been done, so it's no use doing any more, or even if there are new forms to try you require a PhD to work them out.*

This series of articles is an attempt to change this outlook, and show that there is plenty of room yet for valuable contributions to be made by amateurs. To do this, a basic computer program will be developed which will be capable of running on most home computers. Further, the underlying Equations, etc on which this program is based will also be given.

The features of this program are:
— *Directive Gain Figures*
— *Pattern Plots*
— *Input Impedances*
— *Element Currents*
— *Front to Back Ratio*

It will provide these for any two dimensional array of dipoles, with any or all elements driven. As such, it is usable on normal Yagis; Stacked Yagis; Driven Arrays and a large number of other configurations which do not have names.

It must however always be kept in mind that the program uses a theoretical approach and as such gives theoretical answers. The real world is much more complex than the simple models that will be presented here and as such, output from the program should be treated with care. Further comments on its accuracy and application will be given later.

THE CO-ORDINATE SYSTEM

Before going into the depths of how to accomplish the above, a few basics must be established. For most of these is the co-ordinate system, ie how we can mathematically describe where our elements are in space.

The system to be used here is shown in Figure one. As can be seen there is an X, Y and Z axis giving full three-dimensional coverage. It is rare, however, that this is the axis used in calculations. Quite a deal of simplification can be made if the other axis shown are used, ie the Theta, Phi and R. This system may be new to many amateurs, but a little thought should have most happy with its use. As an example, an element is shown with its centre at X=1, Y=1, Z=1, this element could also be seen to be at Theta=45 degrees, Phi=45 degrees, and R=1. It is usual to have the major lobe, or direction of greatest gain at Theta=0 degrees or directly along the Z axis.

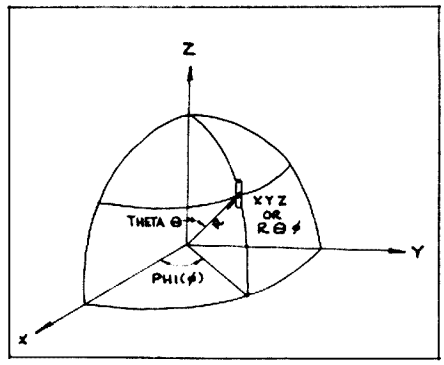


Figure 1 — Co-ordinate system for antenna analysis.

COMPLEX NUMBERS

All amateurs should be aware of the terms resistance, reactance and impedance. They may not, however, be used to thinking of them in terms of complex numbers. For the sake of usage here, a complex number can be simply thought of as one composed of two other ordinary numbers, the *real* and the *imaginary* part. In the impedance case, impedance is really a complex number formed of the real, or resistive part and the imaginary, or reactive part. No further knowledge of complex numbers will be needed to operate the program or to basically understand the rest of the explanations which follow. However, it will be necessary to recognise complex numbers when they come up and realise that the common mathematics which applies to real numbers may not apply to complex numbers. Throughout the following complex numbers will be represented by one or the other of two possible forms:

Form 1 — Real + J Imaginary; eg 10 + J5
or
Form 2 — Magnitude < Angle; eg 11.18 < 26.57 degrees.

The relationship between these forms is shown in Figure 2. Both represent the same complex number but the different forms are more suitable in some circumstances than others so both will be used here at different times.

The quantities that will be expressed here as complex are, impedance, current and voltage.

ELEMENT RADIATION PATTERNS

Most amateurs have been exposed to the concept of a pattern of a dipole antenna as shown in Figure 3. But few really know what this means or can represent this mathematically. Conventional amateur literature often only gives the pattern in two planes, the so-called **E** and **H** plane, ignoring all the area between. For our purposes, the E plane is the one that is parallel to the dipole element and the H plane is the one perpendicular to the element.

Patterns can be represented in a number of ways, the two most common are linear proportional to the radiated field strength in Volts/Metre at some arbitrary distance, or logarithmically proportional to the radiated power in Watts/Metre squared.

For a simple half-wave dipole in free space, formulas often given for E and H plane patterns are Equations 1a and 1b for the E plane and 2a and 2b for the H plane. In both cases the dipole is in our co-ordinated system situated at X,Y,Z = 0 in line with the Z axis.

1a. $F(\theta)=K*\cos(90*\cos(\theta))/\sin(\theta)$

1b. $W(\theta)=K*20*\log_{10}(F(\theta))$

2a. $F(\phi)=K$

2b. $W(\phi)=K*20*\log_{10}(F(\phi))$

However, these Equations are not sufficient for our purposes here, to find the true directive gain later it is necessary to have an expression in terms of both Theta and Phi. This more complex Equation is given in Equation 3a and b:

3a. $F(\theta,\phi)=K*(\cos(90*\sin(\theta)\cos(\phi))/\mathrm{sqr}(1-(\sin(T)*\cos(\phi))^2)$

3b. $W(\theta,\phi)=K*20*\log(F(\theta,\phi))$

At theta equals 90 degrees Equation 3a reduces to Equation 2a. At Phi equals zero Equation 3a reduces to Equation 1a.

It will be this pattern which will be assumed for all later calculations.

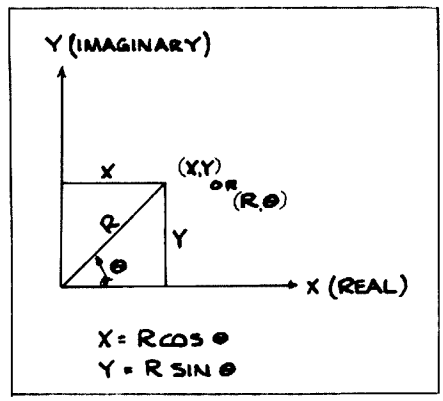


Figure 2 — Relationship between polar and rectangular complex number.

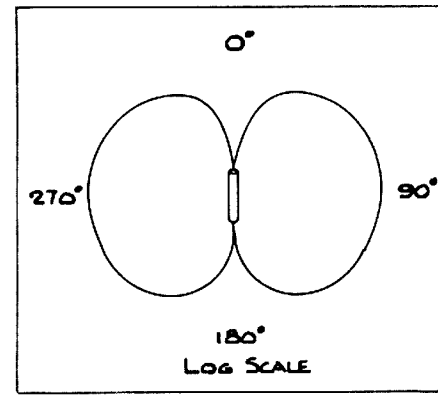


Figure 3 — Typical E plane half-wave dipole pattern.

ARRAYS

Figure 4 shows a basic one dimensional array composed of two elements, one and two. In this case, for simplicity, isotropic radiators will be used, ie each element radiates equally well in all directions. If we imagine that we wish to determine the relative field intensity at some distant point P which is so far away that Theta 1 is approximately equal to Theta 2. Then the field in this direction can be expressed in terms of the complex element currents and phase differences, and the spacing of the elements. In general then for this situation Equation 4 gives the field expression for this array.

For more than two elements we get Equation 5, which is just the sum of a number of Equation 4s from element 1 to N.

4. $F(\theta)=K*(I_1<A_1+I_2<A_2+(2*\pi/\lambda)*S*\cos(\theta)$

5. $F(\theta)=K*\sum_{n=1}^{N} I_n<(A_n+(2*\pi/\lambda)*S_n*\cos(\theta))$

This Equation can be extended to apply to Figure 5, where a two dimensional array is used giving Equation 6.

6. $F(\theta)=K*\sum_{n=1}^{N} I_n<(A_n+(2*\pi/\lambda)*S_n*\cos(\theta-B_n))$

Once again this only gives the array pattern in the Theta plane and we require both Theta and Phi variations. It can be shown that in this case for the two dimensional array in Figure 5, the field pattern is given by Equation 7.

7. $F(\theta,\phi)=K*\sum_{n=1}^{N} I_n<(A_n+(2*\pi/\lambda)*S_n*(\sin(B_n*\sin(\theta)*\sin(\phi)+\cos(B_n)*\cos(T)))$

Further, if the array is composed of other than isotropic elements then the principle of pattern multiplication states that the total pattern can be found by multiplying the *Element Pattern* by the *Array Pattern* for isotropic elements which has the special name of the *Array Factor.* So the total pattern can be found by multiplying Equation 3a by Equation 7.

This Equation can then be evaluated using numerical integration techniques to provide a value of directive gain for any arbitrary two dimensional array.

If we assume that our antenna array system has no losses then the *Directive Gain* can be equated to the gain figure usually given for arrays by Equation 10, where the dBi specifies that this is gain over an isotropic radiator.

Figure 4 — A one-dimensional array of point sources.

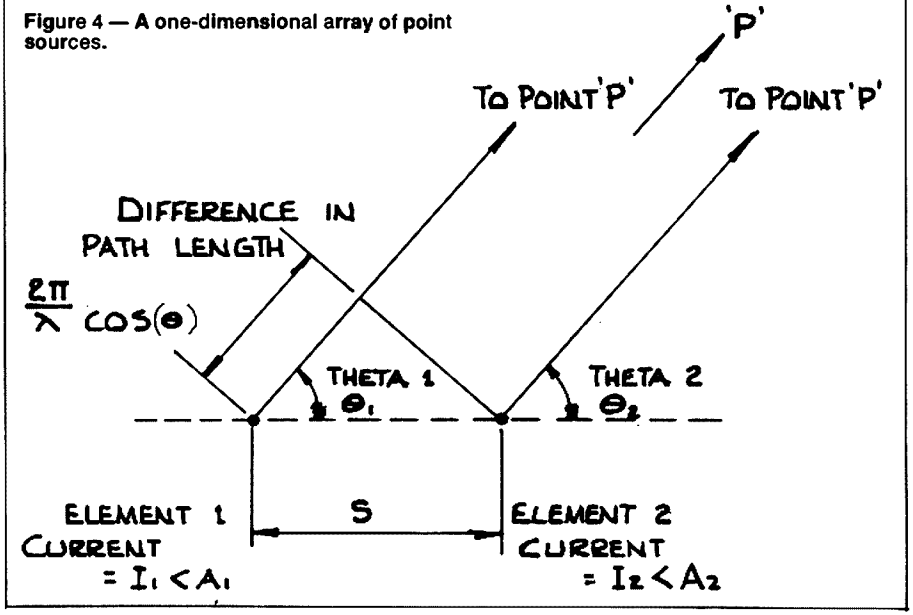
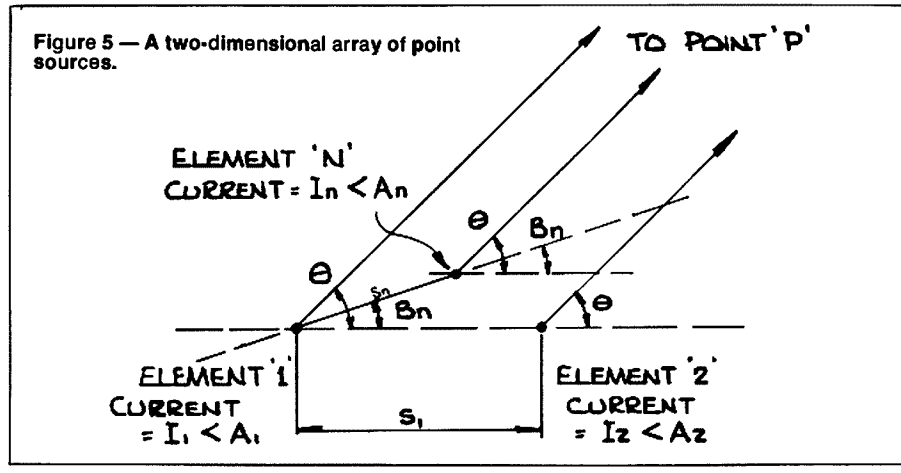


Figure 5 — A two-dimensional array of point sources.



DIRECTIVITY AND GAIN

Directivity is defined as being the ratio of the maximum radiation intensity to the average radiation intensity (Equation 8).

8. D = U max/U average

It can be shown (see Reference 1) that this can also be expressed as Equation 9.

9. $D=4*\pi*F^2(\theta,\phi)\max/(\int\int F^2(\theta,\phi)\sin(\theta)d\theta d\phi)$

10. Gain dBi = 10*log(D)

ELEMENT CURRENTS

So we now have enough information to determine patterns and gains of an arbitrary array, but only if we know the complex element currents. A number of programs have appeared in amateur literature to give patterns etc, but all assume that we know these currents. In fact, it is not as simple as that, or else Yagi-type antennas would never work. In real life antenna elements do not act in isolation. Currents in one element set up currents in other elements via mutual effects. (For further information see Reference 2). To truly calculate patterns, etc this effect must be allowed for. One way of doing this is described in Reference 3.

In summary, this method uses matrix methods to solve the complex multi-element form of Equation 11.

11. [Z]X[I] = [V]

This then can be solved for I, but only if we know V and Z. Luckily enough, we can, in most cases, determine V and a number of methods have been proposed to calculate Z (see References 1, 2, 3, 4 and 5). The method chosen here is the so called *integral equation* approach and is explained best in References 1 and 5.

CONCLUSION

In the next part we will take the above information and show how it can be implemental in terms of a basic computer program.

References:

1 J D Kraus Antennas — McGraw Hill New York 1950.
2 F Gehrke Vertical Phased Arrays, Ham Radio July 1983.
3 J L Lawson Yagi Antenna Design, Ham Radio January 1980.
4 W L Stutzman & G A Thiele Antenna Theory & Design — John Wiley & Sons New York 1981.
5 C A Balawis Antenna Theory — Harper & Row New York 1982.

EQUATION KEY

F, is the Field Strength in Volts/Metre.
θ, is the angle Theta as shown in the Figures.
K, is a constant expression which does not effect the final outcome of this program.
W, is the Field Strength (Power Density) in Watts/Metre².
φ, is the angle Phi as shown in the Figures.
I_n, is the Magnitude of the current in the nth element as shown in the diagram.
A_n, is the Phase or Angle of the current in the nth element as shown in the diagram.
λ, is the wave-length in metres at the frequency of interest.
S_n, is the spacing in metres between the reference element and the nth element.
B_n, is the spacing in Degrees from the reference plane and the nth element, as shown in the diagram.
D, is the Directivity.
U, is similar to W but not necessarily in dB.
∫∫dθdφ, is the double surface integral.
[Z],[I],[V], are the complex matrix values of Impedance, Current and Voltage respectively.

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Field Days Can Be Fun

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. . . and frustrating tool Reflections on preparation and operating in the 1986 John Moyle Memorial National Field Day, with data on some effective antennas for portable use. Nostalgic reminiscences of some earlier field days recall an era when portable meant anything with two handles which could be manhandled on to a Field Day site.

John Hampel VK5SJ
16 Mitchell Street, Glengowrie, SA. 5044

It all began when my son-in-law David VK5ADO, watched me delving into his Swan 240 to coax the receiver section back to life.

David was checking on up-coming contest dates and suggested the John Moyle event . . . after all, field days are fun (he said).

I held a different view based on memories of two earlier field days in 1950 and 1954.

SOME NOSTALGIA

The VK5 Northern Net organised a field day at Kulpara on October 29, 1950. As I was a Net Controller for that group, this would be an ideal way to meet with the voices on the other side of the microphone. An ex-disposals 108 was modified for the occasion. Three quarters of a watt into a random wire should work someone! (It proved to be plenty of power to win a prize (pair of 807s) for the best DX on the day).

Early arrival at the venue cornered the best antenna supports in the form of two basket-ball goal-posts. As the other stations arrived, car mounted whips and ex-Army tank whips sprang up around us. Ken VK5AL, found a tree stump at the opposite end of the oval; to support a vertical. As 9 am approached, we awaited the WIA Sunday Morning Broadcast from Adelaide, by Reg VK5RR. The 40 metre band was dead. Max VK5GF, was complaining of similar conditions on six metres.

After an hour of deadly silence, Brian VK5CO, remarked that he had heard on 20 metres the previous night that high sun spot disturbance was expected for a couple of days. Les VK5UX, the organiser of the whole day, told the group the bad news but hoped we would still make it an enjoyable day.

VK5AL strode off across the oval, called me for a 5 x 9 signal both ways in our logs to win the DX Trophy before packing up to join in a cricket match. Austin VK5WO, won a prize for receiving 28 WPM and Clarrie VK5KL, won a prize for a smart home-brew six metre converter.

As a field day, it was a sun-spot washout. As a social outing, it was rated as a roaring success as so many had the opportunity to meet the regular check-ins on the Northern Net. It also provided some copy for my columns as VK5BJ, Amateur Radio Editor of the then A G Hull's *Australasian Radio World,* for December 1950, which was its last issue. The following month there was a change of publisher and title to *Australian Radio and Electronics,* under the ownership of Lay Cranch VK2XC, now VK3CF of Radio Amateur Old Timers Club (RAOTC) fame.

The following year, the VK5 Division organised Sunday, January 28, to stimulate interest in the WIA National Field Day. There had been little support for these events since activities resumed after WWII and this was calculated to encourage more portable operation.

The site chosen was a long stretch of beach at Taperoo. The area is now the North Haven multi-million dollar housing development and boating marina. In 1951 there wasn't a pole or tree in sight and vehicle access was pretty dicey over the sand dunes.

We all enjoyed meeting fellow amateurs including John VK3AJI, who came over especially for the day. There was some activity by intrepid operators who erected those ever-present tank whips only to see them keel over to semi- verticals or, more often, horizontals in the soft sand.

Again it was a great social outing but the inevitable cricket match won out over radio.

Field day operating was off my log book for a few years when I signed VK2AFW from Broken Hill. One of my fellow workers at the local radio station was an announcer who was interested in amateur radio and often visited the shack. He saw a reference to the National Field Day for 1954 in *Amateur Radio.* As we sometimes took the rig out to "chop picnics" for a few hours, why not make it a full operation?

This time the site chosen was one we often used in the dry creek bed of Stephen's Creek, east of Broken Hill.

The rig was an ex-US Air Force TCS with genemotor power supplies from two 17 plate, 12 volt Industrial batteries.

The TCS series was a fine rig compared to those old No 11, No 19 and FS6 disposals sets which were heard in profusion after the War. Mine carried the Collins name-plate as contractor to the USAF. Many famous old names of US communications had contributed to its manufacture. The assembly was by Hazeltine Electronics, the meters from Triplett, coils by Hammarlund, the superb tuning condensers were by James Millen, the microphone insert from Turner and the power unit was mainly Dubilier.

Both receiver and transmitter used identical switched crystals (from Bliley) or VFO control. 1625s (12 volt 807s) plate modulated another pair of the same valves at 35 watts AM. The unit I purchased was complete with remote control unit, external speaker and aerial loading coil in new condition for 35 pounds ($70) and weighed in at 170 pounds (77 kg). Compare that load to be packed into a car with transceivers of today. Portable station operators in those days were a dedicated few.

After a few hours into the Field Day Contest, a storm headed our way followed by rain soon after. We packed as hurriedly as possible with the heavy weight gear and called-it-a-day. When the local paper arrived next morning, it carried a front page which told how lucky we were to cease operating the previous day. Stephen's Creek had been fed by a cloud-burst further north and floods had raced through our operating location about 10 minutes after we left, filling the local reservoir for the first time in two and a half years.

PLANNING

Thinking about those earlier forays into field days did nothing to raise my enthusiasm for the 1986 John Moyle Memorial Field Day.

However, David kept the subject to the fore until I finally gave in. Yes — we would give it a go. It would provide me the opportunity to try out some antenna ideas which couldn't be fitted into the home QTH block and keep up the activity for Jubilee 150 activity from VK5.

About this time, my sister-in-law bought a property near Clare, 140 km north of Adelaide. From photographs of the farm it looked ideal. Elevation was 250 metres ASL with trees in the right places for a rhombic and long wires. I had to admit I was now warming to the idea a lot more. Arrangements were made to visit the farm about three weeks before the field day weekend. Then the first problem appeared — on that weekend there would be my niece and friends in occupation for horse-riding and the only building, a small bunk-house, which would become the temporary amateur shack wasn't available.

A brother-in-law had a bus converted to a mobile home stored on blocks, somewhere in the Adelaide Hills. Now this sounded even better until a telephone call revealed that it had been moved back to the city only the previous week.

By this time, planning of desirable antennas had been finalised and a new drive to find a site was important. Many telephone calls produced zero results. I had the distinct feeling that some of these contacts believed the country-side was about to become a mini-Radio Australia, trees would be damaged and, worst of all, TVI would be introduced into an otherwise quiet existence. Retribution would be mine sooner or later, when the inevitable request to 'fix our hi-fi' or 'look at our television mast-head amplifier' comes around.

Overhearing my lack of success on the telephone, my daughter suggested a farm where she goes horse riding. So, I phone the owner, he has no objections, is even enthusiastic, suggests best site as he works UHF CB from there. Finally he mentions there is a new shed built since the bush fires on Ash Wednesday and it is at the highest point in the Bugle Ranges, Mount Wilson, 125 metres ASL. Would I like to see it tomorrow as he is going down? If it had not been night time I would have been ready to go, right then!

Arrival at the farm brought a pleasant surprise. The shed mentioned the previous night was much larger than expected. Although cluttered with old tractors and implements, it also sported an ideal operating table plus chairs and a folding lounge stored there — a ready made field day shack.

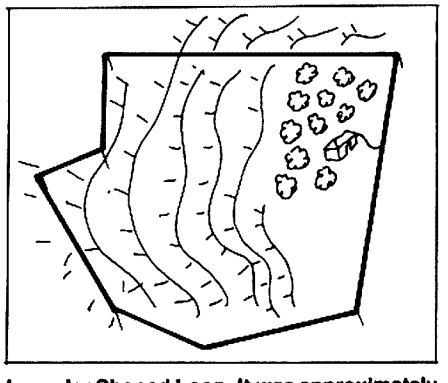
Outside were several gums, devoid of foliage since the bush fires, which would be ideal for supporting our antennas. The land sloped steeply on three sides and visions of a sloping terminated V-beam came to mind.

Our host then came up with an offer to use his generator, powered by an old Ferguson tractor engine. Occasionally it saw duty to pump water from a dam down the hill and "the run will do it good."

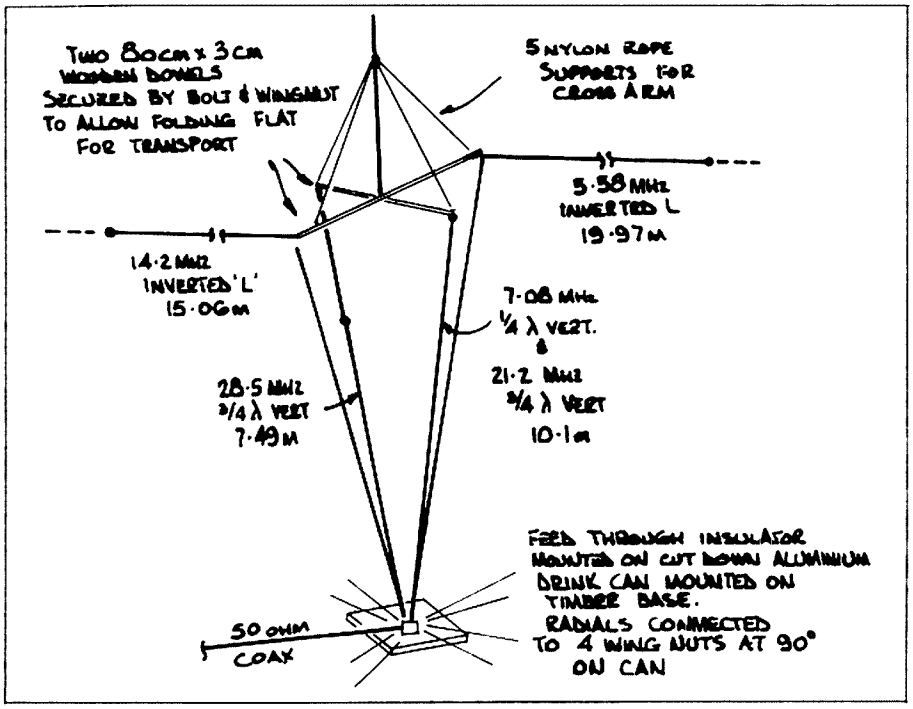
A portable generator had already been arranged. At this point, David's mind was already planning ahead. He had spotted another, smaller shed on a distant hill to the south. The owner confirmed it could also be used over the weekend. This also meant I lost my second operator — VK5ADO would operate from the second site.

The owner left us to look around with a reminder to 'close gates' before leaving. Also, something about a mean bull which did not cause any concern then but, I would have good reason to remember later while erecting an antenna.

David became interested in the fence around the area. Apparently it had once served as an electric fence and, as far as our inspection took in, the plastic insulators still appeared sound. Heavy insulated cable dived under gate openings, but it looked too inviting to ignore.



Irregular Shaped Loop. It was approximately 1800 metres long.



Multi-Band Vertical/Inverted L.
Radial Lengths:

3.580 MHz — 20.42 metres
7.080 MHz — 10.35 metres
14.200 MHz — 5.18 metres
21.200 MHz — 3.45 metres
28.500 MHz — 2.56 metres

I had brought a multi-meter to test ground conductivity. This soon revealed that the fence was a continuous loop back to a cut made as a test point opposite the shed. Earlier success with a 7 MHz loop only 70 cm above ground at the home QTH fired the imagination. This one was at least 1200 metres (later checked closer to 1800 metres) and about 150 cm high. It would be fired up on 3.5 MHz for the field day.

Driving home we assessed what was available. David would now use his trusty Swan, plus home-brew transverter for 21 and 28 MHz with a common feed coaxial cable to simple dipoles. The problem would be finding enough three-core cable to use with the generators.

PREPARATION

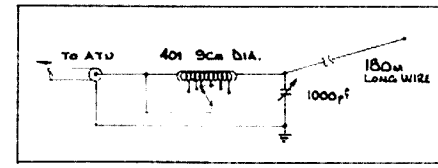
Over the next three days of scrounging, we had amassed a motley collection of extension cords in varying lengths with some in dubious condition. They would all have to be checked, a vital safety exercise which took a whole day. A concern was to find that two of the cables, with moulded plugs and sockets, had been manufactured with transposed active and neutral, whilst another was made as a two-core cable with no earth and no indication that perhaps it was for use with double insulated appliances. In all, after modification of the faulty cables, a total of 310 metres was available.

Although the basic antenna types had been decided, the construction and erection now had to be reconsidered since I would be going it alone as a single operator station. Clearly the antennas would need to be made up in a manner allowing quick, simple rigging on-site.

The front lawn became a source of wonder for neighbours and passers-by. Old transformers and black and white television deflection coils were unwound plus discarded house wiring (kindly donated by Ted VK5PEB) were all pressed into service, measured and packed. Sets of radials were individually wound on coffee jars and marked for reference. When these were assembled at the field day it was a simple matter to unwind each radial and the jar held the wire in place. Two cartons of radials were packed so that there would be at least four for each HF band.

The main body of the multi-band vertical sloped down 45 degrees from the tree to the feed-point. The inverted L sections for 3.5 and 14 MHz extended out to the sides.

Next a multi-band wire vertical-cum-inverted-L was assembled and coiled up carefully for transport. Each antenna wire and feedline were colour-coded with insulation tapes to avoid confusion later. This proved to be a time-saver when the antennas were going up and various feedlines brought into the operating position.



Long Wire — All Bands.
Circuit of the Auxiliary Tuner used with the ATU for the Long Wire and Horizontal Fence Loop Antennas.

Obviously, to utilise the various antennas it would be necessary to switch between them and without confusion under contest conditions. A board to select feeders and inputs to the ATU was made up so that the status of switches could be determined at a glance. Some manila card was added and ruled up to note tuner settings.

A bow and arrow had been promised by Bob VK5ZAL. While collecting this sky- hook tool, he mentioned some bits and pieces that were to be thrown out. A lucky coincidence that among the items were some porcelain feed-through insulators and a GR Laboratory Standard 1000 pF variable capacitor. Later that day, the insulators were installed on the switchboard for long wire selection. The capacitor and a Collins loading coil (from that TCS of 1954) were bread-boarded into a long wire tuner.

DISASTER STRIKES

It was now Wednesday. Every item had by now been checked at least twice. All was well. At least until that night. I was nearing the end of a Jubilee 150 Net on 21 MHz when the drive on my TS-520 became erratic. The next three hours of trouble-shooting produced no results and worse, the rig was inoperative on all bands.

An early start next morning saw the rig working on the two low bands for a short while. After about 30 minutes, drive disappeared again so that by mid- morning, it was clearly a case of no rig for the field day.

(The following week the fault was traced to overheating during long operation sessions. The trouble has not re-appeared since providing better air flow around the transceiver. The heating had caused the driver-stage coil formers to expand slightly allowing the cores to move. They were locked in position and realigned after threading a strand of hair around each core — an old trick used by servicemen who would use a cotton thread to lock sloppy IFs on old broadcast sets).

Some phoning produced a happier result after the third call. Ken VK5QW, had a spare IC-751 which he kindly delivered to my QTH a couple of hours later. Our field day hopes had been reinstated.

How all the gear fitted into one car was an exercise in packing. The boot was persuaded to close and the partly assembled 21 MHz beam tubes stuck out the window. The generator and jerry cans of fuel had gone ahead with the farm owner. We reflected on this decision as we squeezed into the remaining space and headed south.

SETTING UP

Arrival at the farm on Friday afternoon indicated a change in scenery since the first visit. Cattle has used the top paddock that day and left calling-cards all around the shed. Transferring the gear from the car was carried out with extra care. David took the car and headed down the range.

Previous arrangements were to check into the Jubilee 150 Net that night, so I concentrated on erecting a 3.5 MHz wire and connecting up the fence loop. No rainfall in the area for over three months meant the soil was dry and packed hard. After draining a near empty storage tank, plus sacrificing our drinking water supplies, an earth stake was persuaded into the ground. Quarter wave coupling radials for each band were also connected to the ATU.

These radials proved useful when the loop or long wire were used. Without them, the tuner would only bring the SWR down to 2:1 at best

(over 3.5 on 14 MHz with the long wire). With the radials in circuit, the SWR was barely readable on all bands.

By 0915 UTC, David returned taking things at a more leisurely pace. He would wait until Saturday morning to put up dipoles — after all, I had the bow and arrow. We had overlooked this in our planning and arrangements were made for the next day.

Listening on 3.5 MHz, we were impressed by the healthy sound of the band. Used to an S7 noise level most times at home, this was luxury. Noise was almost non-existent, particularly on the loop. This was a feature of the loop I had used before.

Using the inverted dipole, I called Gordon VK5KGS, and we were, as expected, S9 back in Adelaide. A change to the loop was dramatic to say the least. As the IC-751 had a variable power output control, I cut back to 10 watts using a fairly accurate power meter for the test. Other stations waiting for the J150 Net gave us reports of still over S9. The loading was reduced, processor taken out of circuit and the microphone gain wound back until finally the indicated power was 600 mW. We were still S9 in Adelaide and Port Augusta. A VK4, north of Townsville called in to report that the signal had dropped from S9 to S7 since the start of the tests.

The quiet location and antenna efficiency made working on the Net a most pleasurable evening. Stations in VK4, VK6, and ZL that I had often heard before at home were now 4-5 S-points up. All sounded well for some interesting operation in the contest the next night. The most important consideration now was an early night as I planned a brisk start on erecting antennas on Saturday morning.

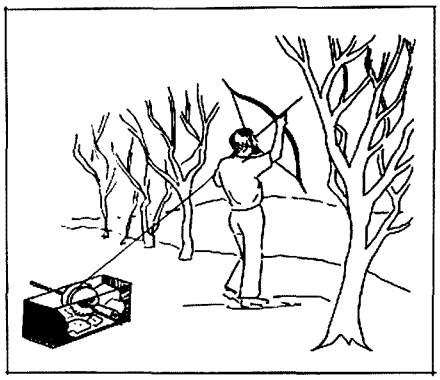
A 6 am start did not impress David, but there was a lot still to be done. I left him to cook our breakfast while I pushed on. Lines to support a vertical and a two element sloper were soon in place with the aid of the bow and arrow. After some unsuccessful attempts when the fishing line snagged on tufts of dry grass, a feed for the line was fashioned with a screw-driver and cardboard carton. Rocks held the crude, but effective device in place.

The all-bander was intended as a true vertical. The coaxial cable now had to reach the rig through the only access of the shed door which meant the feed point was away from the only convenient tree. Text books put forward various values of feed point impedance for both top and bottom fed verticals and slopers. Noise bridge tests indicate a figure of 43 ohms at each of the designed frequencies.

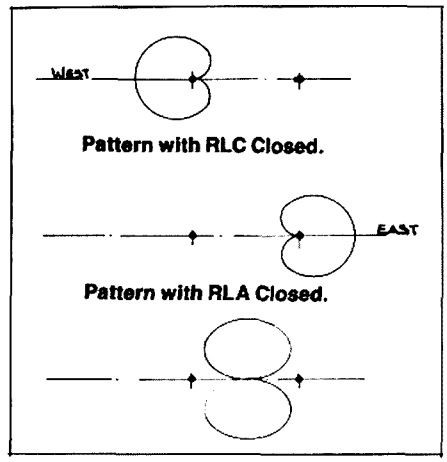
The simplicity and efficiency of this antenna commend its use for any home station where a modest number of radials are possible. Multi-band 300 ohm ribbon stubs or inductively loaded short radials would be an alternative for consideration.

The 14 MHz sloper beam proved to be a valuable inclusion with modest gain and impressive front-to-back ratio for VK2-VK6. When activity around VK was slow the sloper provided some interesting DX. Although only worth two contest points per contact, working DX at this *location* was a breeze.

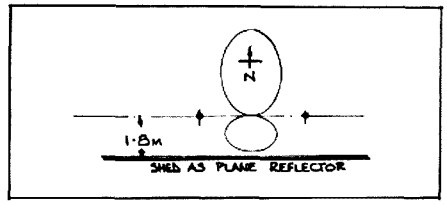
A 21 MHz vertical beam had been planned on the basis that it could be installed at ground level. Besides switching patterns from the operating position, it was designed to be set up a quarter wave in front of the shed. This would provide a large reflector with the idea of suppressing, or at least reducing, the rear lobe of the figure-eight pattern when feeding the elements in phase.



Anti-snag set-up for playing out the fishing line using a screw-driver, cardboard carton and rocks to hold it in position. If a second person is available, a 'casting reel' used by anglers could be used. This is a reel open on one side with a flared edge so that it may be held in the hand, and angled in the direction of shooting the line. Other methods of putting a light line over trees for portable antennas are a catapult (should be used with caution and plenty of practice beforehand) or, the simplest expedient of a smooth rock of size equal to the operators throwing ability! Avoid items which may (nay — Murphy's Law says WILL) be caught in the twigs and foliage.

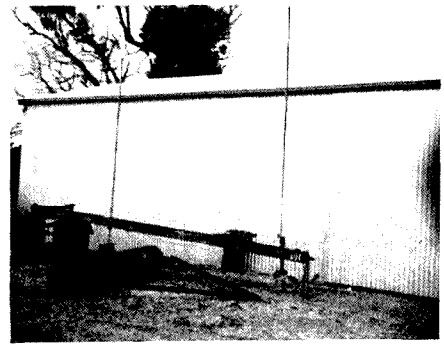


Normal Figure-eight Pattern when phased array is fed in phase (RLB closed).



Shed as Plane Reflector.

Approximate pattern with RLB closed and beam spaced ⅛λ in front of reflector.

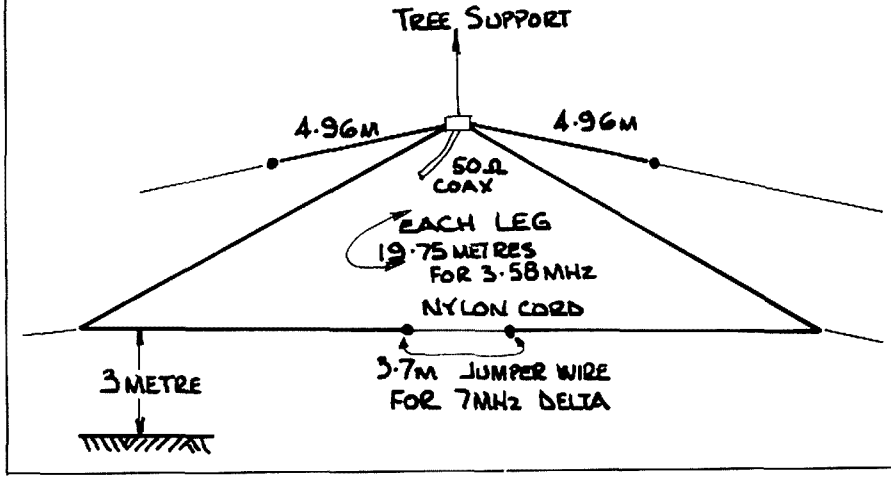


The 21 MHz vertical two-element beam using the shed as a reflector when in phase operation was relay switched.

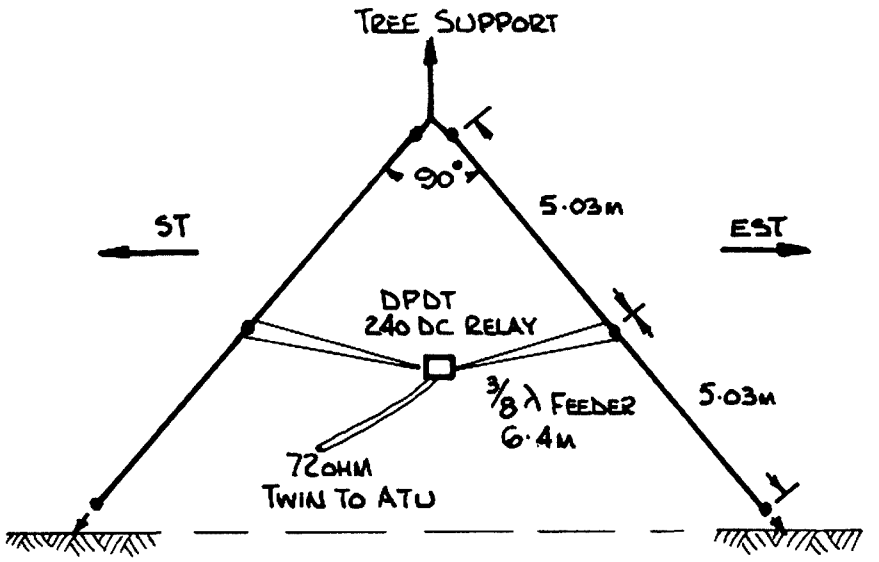
The rocky ground at the point intended stopped any thoughts of getting support stakes in position. A two wheel jinker left when bush fires had destroyed the tray top was wheeled into position alongside the shed. The vertical elements were lashed and U-bolted to this frame. Four radials per element were sloped down and weighted with rocks. Feed point impedance was around 30 ohms which the ATU handled with ease.

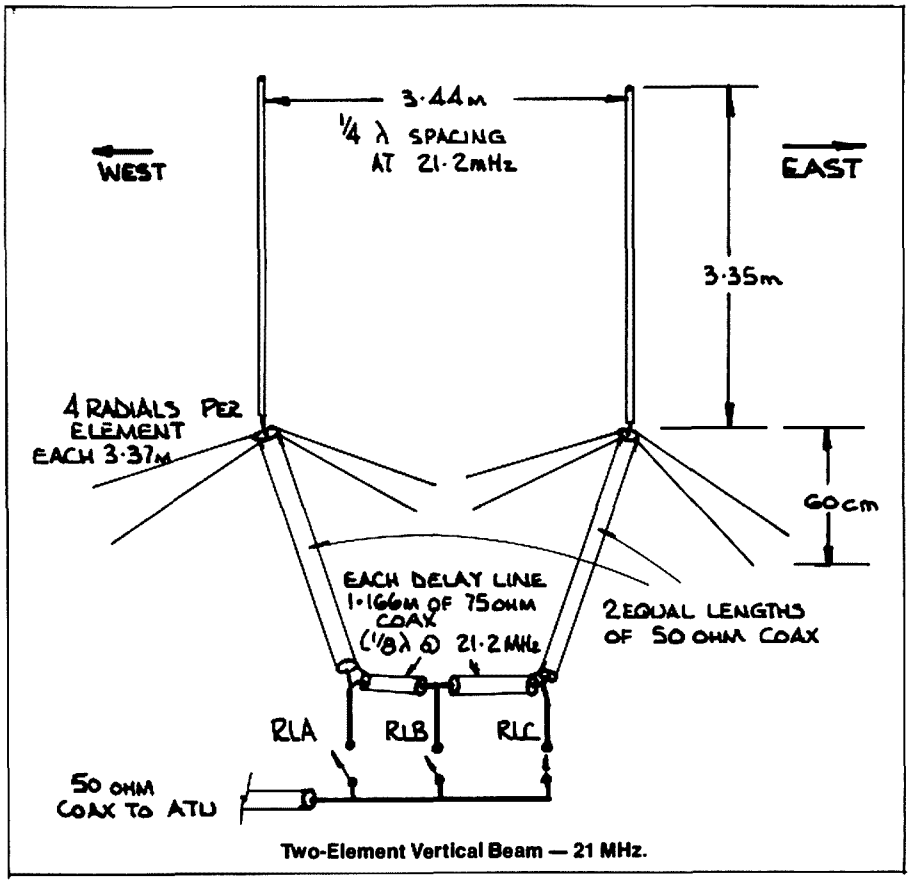
Listening tests indicated the beam worked east-west with some gain and excellent front-to-back ratio. However, when the figure-eight pattern was selected, results on Asian signals weren't as

Inverted Dipoles 3.5/14 MHz — 7 MHz Delta. This inverted dipole cut for 3.580 MHz plus jumper wire to convert to a Delta loop on 7.090 MHz is a copy of the same configuration used at the home QTH. Another dipole running roughly at right angles was added for 14.200 MHz. A common 50 ohm coaxial cable feed was used. As bare wire was used, the formula 141/*f* applies for dipole length in metres. If covered wire had been used, as in the home station antenna, the formula 138/*f* would apply. The height above ground is not ideal but a compromise to allow reaching the dipole ends to clip on the 7 MHz jumper.



Two-Element Sloper Beam — 14 MHz
The dimensions shown resonated at 14.190 MHz using the formula 143/f, which is a good starting point tor sloper calculation. The ends of the dipole were secured by nylon fishing line through soldered loops so there is no insulator end effect with the dimensions shown. A bell-wire twin-line switched the relay in a small plastic container hung from the tree. The twin-line use refers to '14.036' auto-cable, NOT the usual figure-eight lighting twin flexible. A dip-oscillator put the velocity factor at 0.61 so the ⅜λ feeders should be accurately checked. With no voltage applied to the relay, the beam fired east. Application of 24 volts DC selects the other dipole with the unused ⅜λ in each case acting as inductive loading for a reflector element.





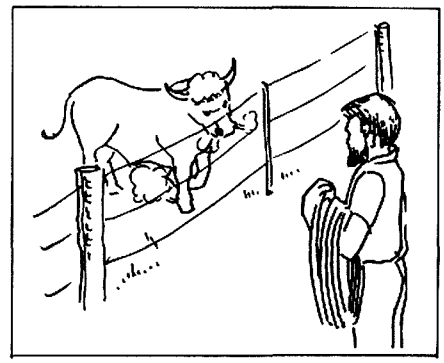
Two-Element Vertical Beam — 21 MHz.

expected. The frame carrying the beam was moved closer to the shed. Results sounded better. Finally the elements were positioned 1.8 metres in front of the reflector (close to an eighth-wave spacing). Up came the signals from the north and the east-west pattern appeared to be unchanged.

Tests with Ron VK5ON and Graham VK5KGP, in Adelaide, confirmed the beam was working well. During the contest, JA, HL and YC stations answered "CO Contest" calls, so it was useful to be able to switch patterns and pick out the weak VK2 and VK4 mobiles for contest points.

After a quick lunch, I tackled the remaining planned antenna. This would be a sloping terminated V-beam (sometimes referred to as a 'Cove' array). The V would slope down from a tree at about 11 metres to bundles of carbon resistors made up to measure about 600 ohms connected to earth rods. This antenna was to provide an approximate 70 degrees included angle for VK4-VK8. One leg was reeled out to the north. This was approximately 12 gauge wire recovered from a 240/110 volt step-down transformer. The other leg would go across an adjacent paddock.

At this point I became aware of the bull which wasn't supposed to be in that area over the weekend. Any approach to the fence brought a 'Oh no you don't' attitude from him. This was his domain and not to be used for antenna experiments. Considering the remaining time left, a convenient solution was to erect the one long



An "Untenna-Bull" Situation — *"... not on this side, OM!"*

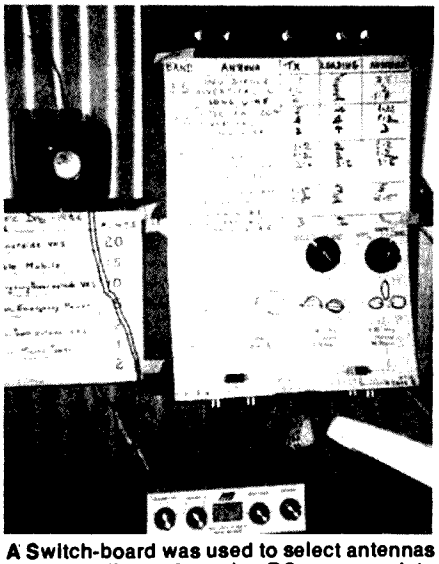
wire in four trees, roughly in a straight line which lined up on about 310 degrees. Not according to plan, but it would have to do. This long wire proved to be useful as the only radiator to work into Adelaide on 28 MHz. Considering the bearing, it was no surprise that it was effective with European DX on 14 MHz.

Only 45 minutes to starting time at 0700 UTC. David came back for sandwiches and coffee, pleased with his afternoon working DX on his favourite 14 MHz band. Both generators were performing faultlessly. Mine made a thumping din downhill by the dam and it would go on to echo right through the night. I hoped it would keep that §¤φϕψ# bull awake!

CONTESTING

Operating went along at a brisk pace. A dupe sheet divided for the three and six hour rules had been set up on a picnic table next to the operating position. This was valuable as there were a high number of calls from stations for repeat contacts even under one hour. They appeared to have no recording to avoid dupes and delayed things at times debating the time of the last log entry. Two dupes did slip by my guard as fatigue set in along the way.

At 1630 UTC, David sounded ready to give-in when we worked. Besides being tired, my signals were causing QRM havoc at his site. I must have nodded off shortly after, as indicated by an indecipherable squiggle on the log sheet for 1640 UTC. It would be 1928 UTC before the next contact. A burst of static proved a most effective alarm clock. A couple of VK4s were mobile around



A Switch-board was used to select antennas and feed lines. 24 volts DC was used to control remote relays for the 14 MHz slopers and 21 MHz vertical beams. Tune up references for the ATU were recorded for quick band changes.

The mobile microphone was mounted on a tubing boom held in place by the ATU. Hands-free operation is an asset for contesting. Antenna selection board is on the wall above the rig.

VK2. They were pleasantly surprised to receive a call and after a short chat about the field day, exchanged contest numbers.

David had been up early hoping to see Halley's Comet and heard "the racket overloading his receiver" as he unkindly described my signal. A short while after he came up to cook breakfast while still keeping an eye on the eastern sky. I was more interested in operating than the Comet, so it was back to the rig, with only a short break for the WIA Broadcast, until the last contact at 0658 UTC.

Highlights of the weekend were:

* the low noise level on all bands
* Dodi HA6NF calling on Saturday night on 14 MHz for a contact for his Jubilee 150 Award
* a long path 5 x 7 both ways with Maurice FT8YA, for a new country on 14 MHz
* working many friends made during J150 Nets who were giving out contest numbers as home stations to provide contest activity
* JAs who couldn't resist the 'CQ Contest' calls and wanted to be part of it
* working stations that would not have been possible at home, even allowing for the excellent band conditions over the field day weekend.

Although two metre equipment was taken along in case of an emergency and VHF multipliers would have been handy, the final result of the 352 HF contacts in 24 hours was satisfying enough.

? ? ?

HOW ABOUT NEXT YEAR?

I have been asked this question many times. After all, the antennas have been stored for some future use. Perhaps next time will be with our local radio club when the extra help erecting antennas would be useful.

However, on one point I am sure. A serious approach to planning and multi- antenna installation is only worthwhile if the 24 hour section is entered. A much simpler set-up would be used if competing for only six hours!

BEAM ROTATORS

It appears many amateurs have trouble with the rotor of the *CDE Ham II* failing to lock.

Here is a simple and cheap method of rectifying the fault.

Fred Lubach VK4RF
163 Loganlea Road, Loganlea, Qld. 4204

Listening around the bands, it appears that I am not the only one who has had trouble with the rotor of the *CDE Ham II Beam Rotator* failing to "lock" due to partial stripping of the teeth inside the lower casting (brake housing) and wear on the brake wedge.

As the cost of importing a new casting was prohibitive, over $100, I devised a simple and very cheap method of rectifying the fault.

First, separate the upper and lower castings (there is no need to dis- connect the control cables) and drill 12 quarter inch (6 mm) holes, every 30 degrees around the perimeter of the bottom housing, so that the holes appear in the centre of the worn teeth, vertically.

Next, insert quarter inch (6mm) bolts, approximately one inch (25mm) long, with the head of the bolts inside, and lock into place with nuts on the outside.

The final step is to grind approximately an eighth of an inch (3 mm) off the brake wedge so that it clears the bolt heads when retracted, and re- assemble.

Taking the width of the bolt heads into account, whether they be square or hexagon, the beam will now be only able to travel about 20 degrees when locked. This modification has proved itself in gale-force winds at my QTH. It is interesting to note that later models have a square tooth design with matching square edge wedge.

The hardest part of this operation is taking the rotor down from the mast, and re-installing it . . .

WATCHDOG TIMERS

"I have had a receiver sitting on 14.103 MHz for over an hour tonight copying solid continuous 'fill' characters from some poor packeteer who has his keying line stuck down. This has also been observed on several occasions on our local Balto/ Wash two metre LAN frequencies. In addition to being very hard on your radio (few radios are designed for continuous commercial service and tend to get quite warm after a few minutes of such service, and after an hour tend to develop a lot of 'krispy kritturs' inside!) this is also very illegal.

"I would advise packeteers to check to make certain your watchdog timer is functioning. TNC 2 owners should make certain that JMP4 is not installed.

"I offer even a stronger concern for users of Kantronics KPC TNCs which apparently do not have any fail-safe watchdog timer included. I would advise all KPC users to build a watchdog and install it as-soon-as-practicable. Operating without a watchdog timer is like playing Russian Roulette."

W3IWI writing in *Gateway*, Vol 2, No 20, The ARRL Packet-Radio Newsletter.

QSP

PROPOSED EMC TECHNICAL STANDARDS FOR VCRs

The VCR performance shall not be affected if operated in a Lecher-line test-cell over the unwanted signal frequency range of 150 kHz to 150 MHz at 130 dB (uV/m) = 3 V/m field strength.

Television sets, which are operated with the VCRs, have already to meet this EMC standard. This standard will apply from Autumn (Europe) 1986.

Exceptions — Until March 31, 1987 the field strength of 115 dB (uV/m) applies for the range 2.500-4.250 MHz and 6.250-7.500 MHz. The field strength will be increased from April 1, 1987 to 120 dB (uV/m) = 1 V/m.

New VCRs will have to meet an EMC level of 130 dB (uV/m) = 3 V/m as from April 1, 1987 (except 3.5 and 7 MHz). 3.5 MHz is the critical frequency (VCR design).

DL1BU (Dipl Ing Gunter Schwarzbeck, Hon Technical Officer of the DARC) found that the latest VCRs (made in West Germany) were immune to the following test cell field strengths:

147 dB (uV/m) = 22.4 V/m at 1.8 MHz
136 dB (uV/m) = 6.3 V/m at 3.5 MHz
146 dB (uV/m) = 28.2 V/m at 7.0 MHz
149 - > 150 (uV/m) = 30 + V/m at 10.1 MHz

This shows what industry can do by careful design when requested by law.

The work of establishing standards was carried out by the DKE (West German Electro-technical Commission), the FTZ (equivalent to DOC in VK) and the DARC (Deutscher Amateur Radio Club).

Written by Dr Ing Gerhard Blechert DL9TJ and translated from *CQ-DL* magazine, April 1986 by Hans Ruckert VK2AOU, for *Amateur Radio*

IF ONLY THEY COULD SEE US NOW!

▽ Crystal control is highly desirable for stability, but leaves you "rockbound." W9DRD recommends using a variable-gap holder to achieve frequency excursions of up to 24 kc at 20 metres, yet retain stability of signal.

But, W1TS, prefers even more flexibility and uses a two-tube electron- coupled oscillator/ exciter unit for maximum freedom to roam the bands.

From *50 years ago, QST*, April 1986

This method for learning the code is not for those that are experts or those who will learn by sound.

LEARNING THE CODE

Rev Suter VK6SA
PO Box 261, Mandurah, WA. 6210

I have recently been hearing and re-reading some of the calls by the WIA for articles for publication, and have also been enjoying the articles that have been accepted for publication in response to such calls.

I am thus encouraged to make this contribution. It is not for those who are experts at the code. Neither is it for those who will learn by sound.

This method was given to me as an illuminated picture. An hour later I knew each letter. (Others have since done the same). What an encouraging change that was from the previous 30 years of frustration of being "unable" to learn it.

The next step was the "slog" of building up receiving speed. For this thanks to *all* Morse broadcasters and a special thanks to VK6s MY, PH and AUK.

The printed code in this article will immediately shape the dits and dahs into meaningful shapes and — Presto, here is meaning; here is Morse! !

The first step is to print faint large capitals with a pencil and then follow around these outlines in *red* felt-tipped pen with the dits and dahs of the letter concerned. The letter that you sketch should be at least two-centimetres high.

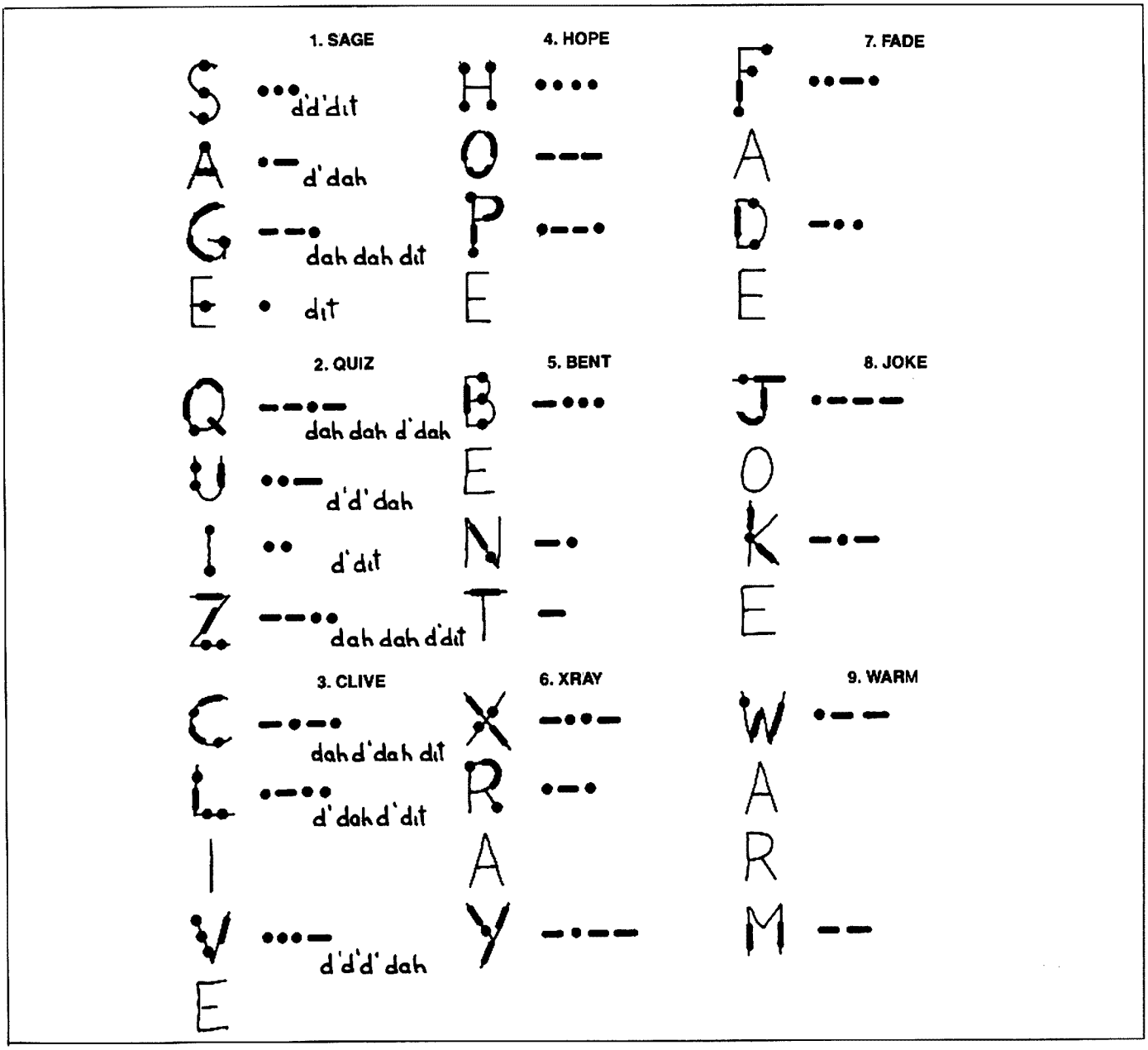
On Figure 1, you will see step two. That is a list of nine words which together include the whole alphabet; print each word on a separate card.

The words depicted have been very carefully selected so that confusion between letters in the same word is minimised.

I would suggest that you first learn only the letters of word one *with all the other letters covered*. Then learn word two, etc. This way you should quickly master the letters.

The next step is to learn the nine-word list so that you can go through it from memory whilst driving, talking, or whatever.

One day, you will enjoy Morse code the same as many folk like good music!



TECHNICAL SYMBOLS

From time to time Amateur Radio magazine and other radio magazines use symbols in technical articles. Eg The capital letter of Omega is used for ohms, lower case Lambda is used for wavelength. It is hoped the following article may explain to newcomers what the various symbols mean.

The Greek Alphabet is given for reference, as many Greek letters appear in Technical Texts

Letter			
Small	**Capital**	**Name**	**English Equivalent**
α	A	Alpha	a
β	B	Beta	b
γ	Γ	Gamma	g
δ	Δ	Delta	d
ϵ	E	Epsilon	e (as in "met")
ζ	Z	Zeta	z
η	H	Eta	ee (as in "meet")
θ	Θ	Theta	th
ι	I	Iota	i
κ	K	Kappa	k
λ	Λ	Lambda	l
μ	M	Mu	m
ν	N	Nu	n
ξ	Ξ	Ksi	x
o	O	Omicron	o (as in "olive")
π	Π	Pi	p
ρ	P	Rho	r
ς	Σ	Sigma	s
τ	T	Tau	t
υ	Υ	Upsilon	u
ϕ	Φ	Phi	ph
χ	X	Chi	ch (as in "school")
ψ	Ψ	Psi	ps
ω	Ω	Omega	o (as in "broke")

Symbols for Quantities for Use in Electrical Equations, etc.

Quantity	Sign
Length	*l*
Mass	*m*
Time	*t*
Angles	θ, ϕ
Work or Energy	W
Power	P
Efficiency	η
Period	T
Frequency	*f*
2π x frequency	ω
Wavelength	λ
Phase displacement	ϕ
Temperature, Celsius	*t* or θ
Temperature, absolute	T or Θ
Quantity or charge of electricity	Q
Current	I
Voltage (EMF or PD)	E or V
Resistance	R
Specific Resistance or Resistivity	ρ
Conductance	G
Specific Conductance or Conductivity	γ
Specific Inductive Capacity or Dielectric Constant	K
Electrostatic Field Strength	X
Electrostatic Displacement or Flux Density	D
Electrostatic Flux	ψ
Capacity	C
Magnetic Pole Strength	*m*
Permeability	μ
Magnetic Field Strength	H
Magnetic Induction or Flux Density	B
Magnetic Reluctance	S
Magneto Motive Force	G
Self Inductance	L
Mutual Inductance	M
Reactance	X
Impedance	Z
Susceptance	B
Admittance	Y
Base of Napierian logs	e
Damping Factor	α
Logarithmic Decrement	δ
Mutual conductance	*gm*
Amplification factor	μ *or m or A*
Percentage modulation	N
Coil amplification factor or Q factor or other active devices (ωL/R).	Q
Velocity of EM Waves	c

Prefixes for Multiples and Submultiples of Quantities

Multiple or Submultiple	Name	Prefix
10^{6}	Mega-	M
10^{3}	Kilo-	*k*
10^{2}	Hekto-	H
10^{-2}	Centi-	c
10^{-3}	Milli-	*m*
10^{-6}	Micro-	μ
10^{-9}	Nano-	*n*
10^{-12}	Pica-	*p*
10^{-15}	Atto-	a

Signs for Units Employed after Numerical Values

Unit	Abbreviation
Ampere	A
Volt	V
Ohm	Ω
Coulomb	C
Joule	J
Watt	W
Farad	F
Henry	H
Watt-hour	Wh
Volt-Ampere	VA
Ampere-hour	Ah
Kilowatt	kW
Kilo-volt-ampere	kVA
Kilowatt-hour	kWh
Decibel	dB

ANTENNAS FOR SATELLITE COMMUNICATIONS

Australia has been committed to communication by satellite, through the Intelsat network, since 1966, and we have now seen the commencement of the domestic system.

Antenna systems are a vital link in the transfer of information between the ground station and the satellite. The extension of existing services and development of new services, such as direct broadcast satellite and international business systems, has led to an increased number of sophisticated satellites in geostationary orbit. These changes have required innovation in many areas, including antenna technology.

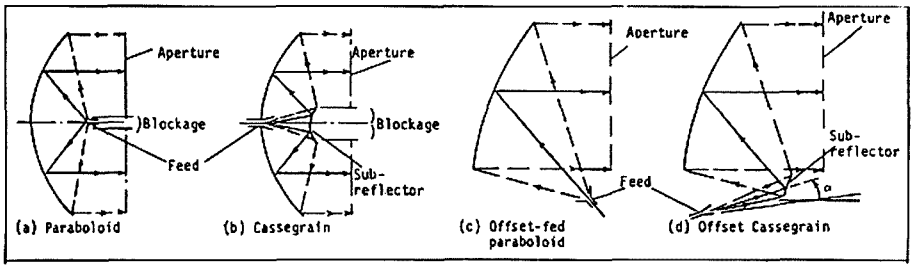


Figure 1 — Reflector antenna configurations.

For ground-station antennas it is common to use a symmetrical Cassegrin reflector configuration (Figure 1b), while on satellites an offset reflector arrangement (Figure 1c, d) is used because it is easier to stow for satellite launch and because the complicated feed network can be located close to the body of the spacecraft.

Figure two shows a typical radiation pattern of the Moree 1 ground station for the Intelsat system which was recently upgraded by Radiophysics in collaboration with OTC. The sharp beam and low radiation levels away from the peak (*sidelobes*) ensure that only one satellite at a time is *seen*. Low sidelobes were achieved by careful design of the aperture illumination (see Figure 3). The desired result was obtained by adjusting the shape of both reflectors of the 27.4 metre Cassegrain. Another feature of the design is the use of wideband corrugated feed horns described in Information Sheet 84/21.

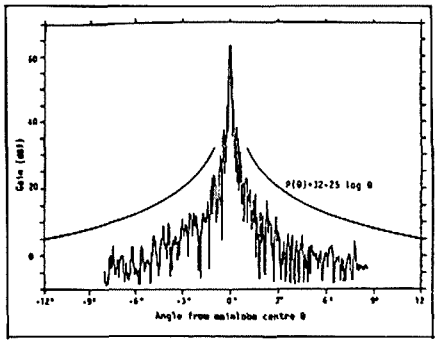


Figure 2 — Moree 1 ground station radiation pattern after upgrading. P (θ) represents the maximum allowed level.

Shaped beams to illuminate a given coverage region (*footprint*) must be produced by an on-board satellite antenna, as shown for example in Figure 4. Commonly an offset reflector (Figure 1c and 1d) is used with a cluster of feed horns near the focus. Each feed horn produces a narrow beam and these multiple beams are combined to give the footprint.

Techniques for designing shaped beams are being developed at Radiophysics. As an example Figure five shows a design for a heptagon region (shown dashed), which is achieved with an offset Cassegrain antenna with 19 feed horns.

From CSIRO Division of Radiophysics Information Sheet No 84/22, written by T S Bird and contributed by Tim Mills VK2ZTM
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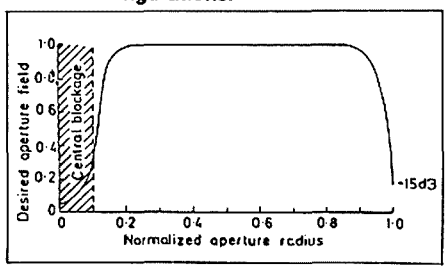


Figure 3 — The optimum design aperture distribution for maximum signal-to-noise ratio and low sidelobe levels.

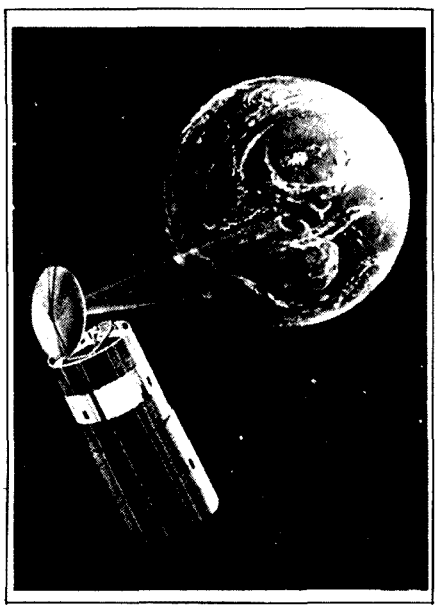


Figure 4 — National Footprint.

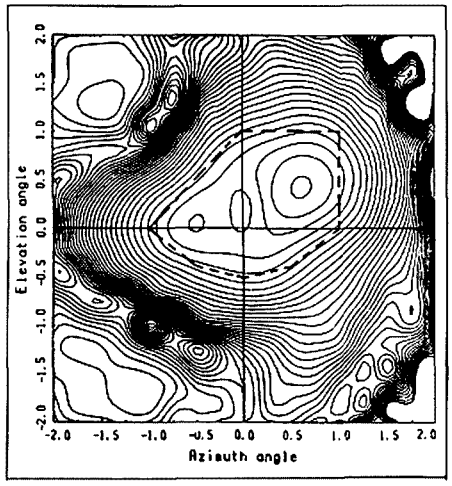


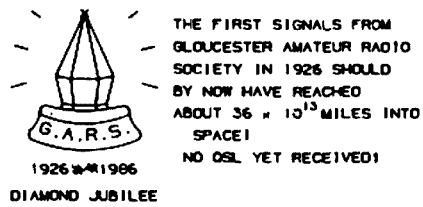
Figure 5 — Contours of intensity of a shaped beam in 1 dB intervals. Peak level is 40 dBi.

CT4 AMATEUR SEEKS SPONSOR FOR MIGRATION TO VK

We have had some correspondence with a Portuguese amateur, Fernando J Fidalgo CT4VQ, ex CR6OZ and ZS1ABG, who would like to migrate to Australia and seeks an Australian sponsor who may be able to find him employment.

He has had four years experience as a waiter in Portugal (1975-79), also as a salesman (1979-83), and a bank clerk in South Africa (1983-86). His English is good, and he is an enthusiastic DX operator. He is aged 32, married, no children.

If any reader (preferably a restaurateur) is able to help, more information is available from the Editor, PO Box 300, Caulfield South, Vic. 3162.



GLOUCESTER AMATEUR RADIO SOCIETY (c 1926)

This year, 1986, is the 900th anniversary of the Doomsday Book, an historic document in British history. The original idea was conceived in Gloucester Cathedral.

To celebrate this historic event, the Gloucester Amateur Radio Society has applied for, and received permission to use, the call sign GB9DB during the month of September.

The station will commence transmitting on Saturday, September 6, 1986 at 1200 UTC on HF, and also VHE The opening time and date coincides with the opening of the Gloucester Local History Festival, which will be located at the same site.

The station will continue operating on various days during September using the special call sign.

The station will be located at Gloscat Oxstalls Campus, Oxstalls Lane, Gloucester, and QSL cards will be available for stations that contact GB9DB. QSLs may be sent via the RSGB Bureau, or direct to G4AYM, 12 Laura Close, Longlevens, Gloucester, GL2 9JH, Great Britain.

Contributed by Nicholas Negus G6AWT, Secretary GARS

NEAR-FIELD AND HOLOGRAPHIC ANTENNA MEASUREMENTS

It is essential to be able to measure the performance of antennas used in satellite and ground-based communications. Since the early 1970s, largely in response to the increasing use of satellite communications, new measurement methods have been developed to overcome some limitations in classical methods of antenna measurement. Two techniques, the near- field and holographic methods, are currently under investigation at Radiophysics. These methods, while furnishing the usual radiation pattern measurements, provide extra information which can be used for antenna alignment and assessment. In addition the holographic method is efficient for in situ measurement of surface errors in large-reflector antennas used for satellite communications and radio astronomy.

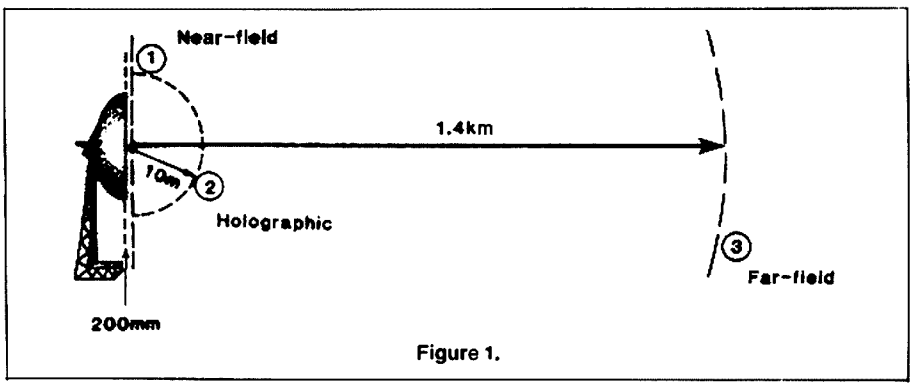


Figure 1.

The techniques under investigation are illustrated in Figure 1 for a three-metre diameter microwave dish antenna for a satellite system. Position three represents the far-field distance conventionally used for antenna measurements. The near- field method (position one) measures very close to the antenna, whereas the holographic method (position two) operators at a somewhat greater distance, although still much less than required for conventional far-field measurements.

An antenna range employing the near-field method is at present being set-up at Radiophysics. This will be fully computer-controlled and will measure antennas up to 2.5 metres in diameter. The type of near-field method is specified by the surface surrounding the antenna on which the radiated signal is sampled. Figure 2 (a) and (b) illustrates the planar and cylindrical scanning surfaces chosen for the facility at Radiophysics. From samples of the signal received by a probe antenna at selected points on the surface the radiation pattern of the test antenna in the far-field region can be computed.

The holographic technique (Figure 2c) is similar to the near-field method in that samples of the receiver signal are taken on a spherical surface from which the far-field radiation pattern is computed. However, because the samples are taken at a greater distance the computations involved are considerably simpler, and therefore faster. Another difference is that a moving probe is unnecessary, as scanning is achieved by rotating the test antenna to specified angles to receive signals from a transmitter. The holographic antenna range at Radiophysics currently operates up to a frequency of 18 GHz, is fully automated and takes antennas up to two metres in diameter. The software developed for this facility is quite general and in the future will be utilised for in situ measurements of large reflector antennas.

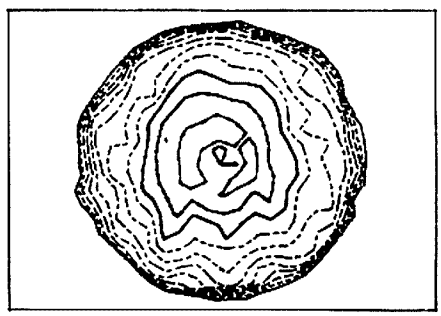


Figure 3 — Contours of intensity of the signal produced in the aperture of a parabolic reflector at 2 dB intervals.

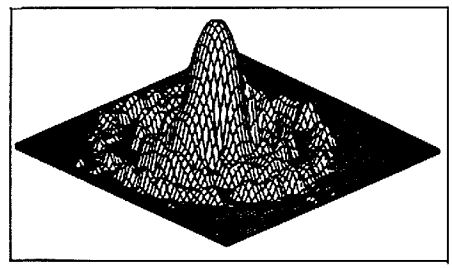


Figure 4 — Radiation pattern of parabolic reflector computed from holographic range data.

An advantage of near-field and holographic methods is that more information about an antenna is obtained in a single measurement. For example, Figure three shows the microwave image of a 1.8 metre diameter parabolic dish measured at 5 GHz on the holographic range. Such images can pinpoint alignment defects in the antenna and also allow assessment of reflector surface errors.

Figure four represents the radiation pattern of the above antenna computed from the holographic range data.

From CSIRO Division of Radiophysics Information Sheet No 84/18, written by G T Poulton and T S Bird and contributed by Tim Mills VK2ZTM
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OUT TO PASTURE

△ The oldest continually operating communications satellite has been turned off after 19 years of service. The ATS-1 was launched in December 1966, providing an important communications link over the Pacific Ocean. It was designed originally for a three-year mission, but surpassed its design life by more than six times. The satellite carried several scientific instruments, including a spin-scan camera that provided the first wide-angle pictures of the Earth's full disc and helped meteorologists track storm fronts. ATS-1 also was used for communications during emergencies and for day-to-day management of the US Trust Territory of the Pacific Islands, a group of more than 2000 islands, commonly known as Micronesia.

From *ITU Telecommunication Journal*, April 1986

NEW DXAC CHAIRMAN

John Parrott W4FRU, has been appointed DX Advisory Committee Chairman, following the resignation of Bob Thompson K6SSJ.

Condensed from *The ARRL Letter*, June 6, 1986

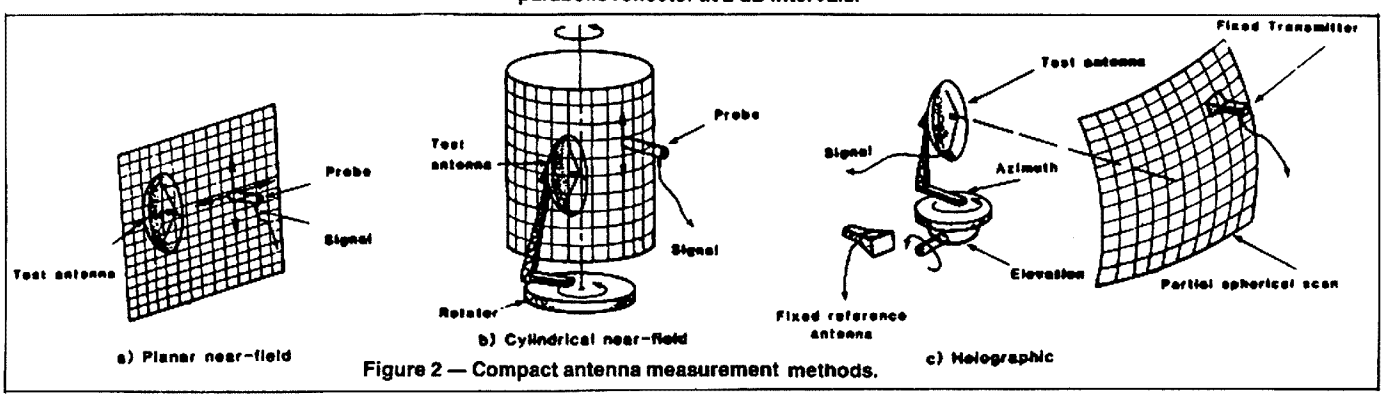

Figure 2 — Compact antenna measurement methods.

REMEMBRANCE DAY CONTEST SCORING

Ron Henderson VK1RH
171 Kingsford Smith Drive, Melba, ACT. 2615

At the 1986 Federal Conference, the Federal Contest Manager, in his Annual Report to the Federal Council, recommended that the scoring formula for the Remembrance Day Contest be examined by someone versed in statistics.

The writer is not academically well qualified in statistics, but as one involved in the revision of the RD Contest scoring system in 1981, believes he can present the logic behind the current system, together with partially refined data from the past 12 years. This basis should make subsequent analysis by statistically bent members easier and their contribution is invited to fulfill the Convention Report recommendation.

The opportunity was also taken to separate the VK8 results to satisfy a further recommendation.

AIM OF THE RD CONTEST

The aim of the RD Contest, as expressed in past contest rules and in the Federal Contest Managers terms of reference is:

This contest is held to commemorate those amateurs who died during the Second World War and is designed to encourage friendly participation between all amateurs and to help in the improvement of operating skills of all participants.

HISTORICAL BACKGROUND

The Remembrance Day Contest scoring system has evolved over some 40 years with changes to keep pace with changing licensing conditions and members wishes.

The early scoring systems applied to full call licensees only (there were no other!) and a scoring table was devised to accommodate the difficulties faced with interstate contacts as well as the differing numbers of amateurs in each State.

With the advent of the Limited Licence, VHF/UHF contacts increased and intra-State contacts were permitted to score. The re-contact frequency for these has been a point of conjecture continuing to this day.

Various trophy score formulae were used. These included averaging the top six log entries, normalising by logs submitted to licenses issued (a participation factor), VHF/UHF bonuses and double score for CW, to mention a few.

The advent of the Novice Licence added new difficulties to RD contest management and in 1980, the VK6 Division reviewed the past performance of Divisions in the contest and recommended a simple scoring system coupled with a revised trophy formula to be adopted. The scoring base proposed was one point per contact and the formula was to include participation, activity and a weighting factor to equalise differing state performances.

PARTICIPATION FACTOR

The participation factor chosen was the percentage of logs submitted to the licenses issued, by Division. This involvement measure is consistent with the aims of the contest and is shown in Table 1 for the past 12 years, together with the number of logs received. Participation is plotted on Figures 1 and 2, first as the number of logs submitted (Figure 1), then as the participation factor (percentage logs to licenses on Figure 2).

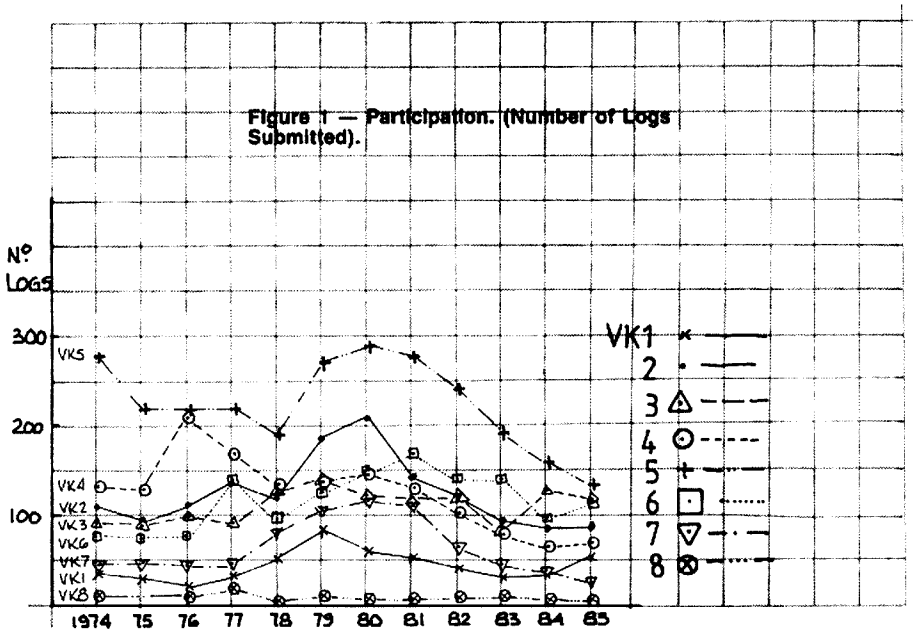

Figure 1 — Participation. (Number of Logs Submitted).

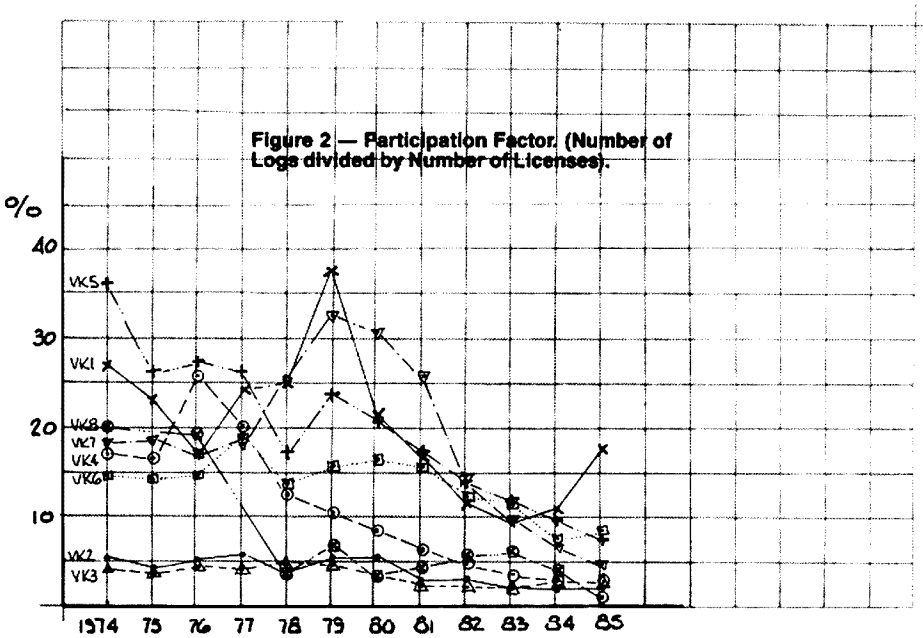

Figure 2 — Participation Factor. (Number of Logs divided by Number of Licenses).

Figure 1 suggests that the number of entrants has been remarkably constant over 12 years whilst the licenced population has grown, yielding the falling participation factors of Figure 2.

ACTIVITY FACTOR

For the activity factor, the ratio of contacts to logs submitted was adopted. This is in effect, a Divisions average contacts per entrant.

Unfortunately, neither the *Amateur Radio* magazine contest results nor the Contest Manager's records show the "contacts made" details for a number of years between 1978 and 1980, however by using average divisional points per contact it is possible to approximate to contacts made. Post 1980, one point per contact prevails (ignoring minor errors due to "CW counts double" interludes in the scoring system).

Activity factors, computed as both points per

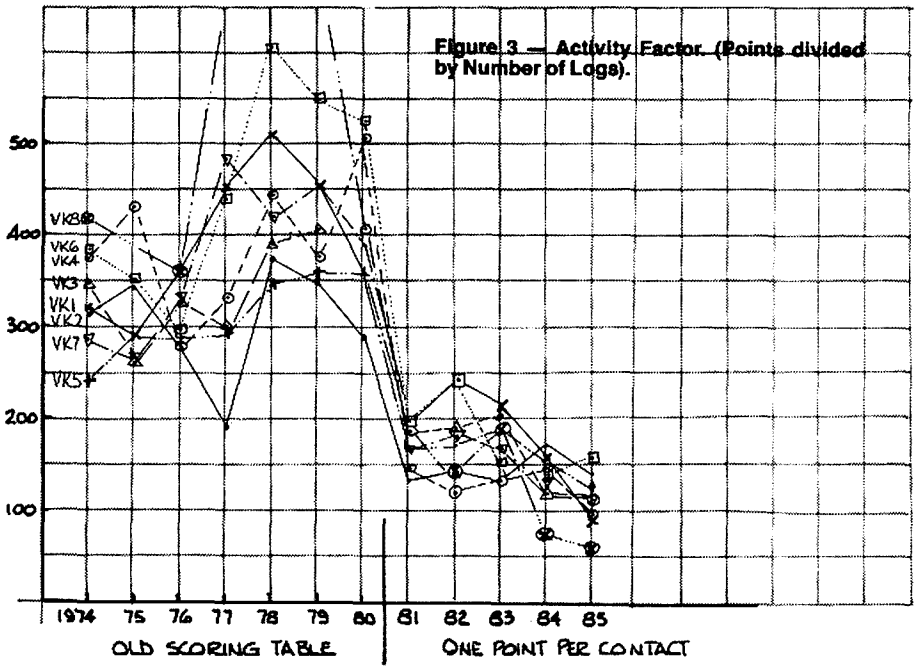

Figure 3 — Activity Factor. (Points divided by Number of Logs).

TABLE 1 — RD CONTEST LOGS SUBMITTED AND PARTICIPATION FACTOR = (Number Logs divided by Number Licenses) %

Division	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
VK1												
Logs Received	35	29	22	35	51	86	60	52	41	30	34	54
Participation Factor %	26.9	23.0	16.8	24.3	25.0	37.6	21.4	16.9	11.6	9.3	10.8	17.6
VK2												
Logs Received	109	89	111	138	120	189	211	139	120	92	87	89
Participation Factor %	5.1	4.0	5.0	5.8	3.6	5.2	5.2	2.9	2.8	2.1	1.9	1.8
VK3												
Logs Received	89	89	97	91	125	141	123	118	121	85	127	121
Participation Factor %	4.3	4.2	4.5	4.1	4.8	4.8	3.4	2.7	2.6	2.1	2.9	2.7
VK4												
Logs Received	132	128	210	170	134	139	144	131	102	77	65	69
Participation Factor %	17.0	16.4	25.6	20.0	12.5	10.4	8.3	6.2	4.8	3.3	2.7	2.8
VK5												
Logs Received	278	218	217	220	190	272	288	278	242	193	160	134
Participation Factor %	36.0	25.9	27.2	26.2	16.9	23.7	21.2	17.0	13.8	11.9	9.4	7.7
VK6/9												
Logs Received	77	74	77	138	96	125	149	170	139	141	96	117
Participation Factor %	14.6	14.1	14.8	23.8	13.6	15.5	16.3	15.6	11.8	11.5	7.3	8.2
VK7												
Logs Received	42	44	41	46	81	104	118	110	64	44	37	26
Participation Factor %	18.1	18.5	16.9	18.3	25.2	32.3	30.7	25.2	13.7	9.2	6.8	4.5
VK8												
Logs Received	11		10	18	4	10	6	7	9	10	6	2
Participation Factor %	19.6		19.0		3.6	6.7	3.5	4.1	5.4	6.0	3.8	1.2

log and contacts per log, are shown in Table 2 and plotted on Figures 3 and 4. After removing the pre-1980 scoring table influence from Figure 3 to create Figure 4, the vestige of a sunspot cycle periodic variation can be detected in the resulting activity curves, which are reasonably consistent and not subject to great variations over 12 years.

RAW SCORES

The product of the participation factor and the activity factor yields the raw scores which must be weighted to compensate for historical divisional performance differences. The raw scores arrived at from Tables 1 and 2 are shown in Table 3. Unfortunately, the mathematical expression for the raw score shows numbers of logs submitted as both a numerator and denominator, vis:

$$\text{Raw Score} = \frac{\text{No logs submitted}}{\text{No licenses issued}} \times \frac{\text{Contest points}}{\text{No logs submitted}}$$

This mathematical correctness has confused some members who have assumed that as the expression cancels it is excluded from consideration.

WEIGHTING FACTORS

To the raw scores there are assigned weighting factors or multipliers which are necessary to achieve a seven-way dead heat. These are shown in Table 4.

When the contest rules are announced in *Amateur Radio* each year, the Contest Manager issues the current years weighting factors, actually predictions based upon a linear least squares fit to each divisions past 10 years of weighting factors and projected forward one year.

Figure 5 shows each division's achieved weighting factors, the linear fit and the predicted next years (1986) factors. The linear fits are at times not particularly brilliant due to scatter in the data (see VK2), but their use avoids the need to use higher order curves of more dubious application.

WHERE TO IN THE FUTURE?

The writer believes the requirements of the VK6 review have been achieved, for the scoring system is simple, both participation and activity are factors in the trophy formula and all divisions have an equal chance of winning. There is concern that a division may run dead in order to receive a high weighting factor, however this poor performance would be necessary over many years to affect the curve fitting over 10 years.

One way to achieve this would be to not submit entries for several years. I do not think amateurs scattered over a State could be "organised" in this manner.

What about some of the other rules? The VHF/UHF re-contact interval has been two-hours in 1980, one-hour from 1981 to 1984, three-hours in 1985, and two-hours this year. The interval has to be short enough to retain the VHF/UHF operators interest and participation, yet long enough for the VHF/UHF intra-State contacts (both ends of which count to the same division) not to swamp the contest results.

CONCLUSIONS

The RD Contest scoring system and trophy formula have changed over the 40-plus years of the contest, the current system aims to include participation and involvement, to which a weighting factor is applied to give each Division an equal chance of winning the trophy based upon past performance.

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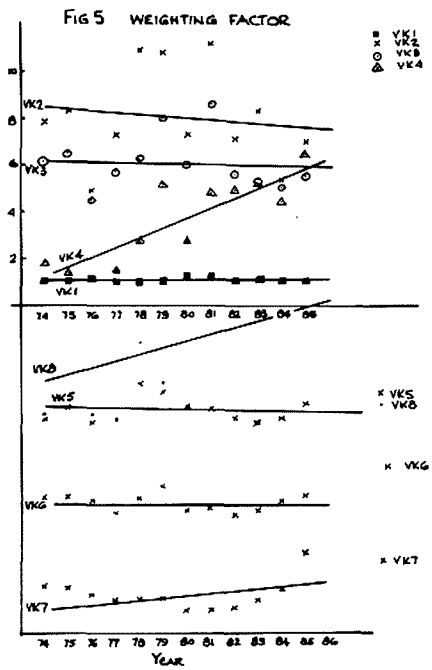

Figure 5 — Weighting Factor.

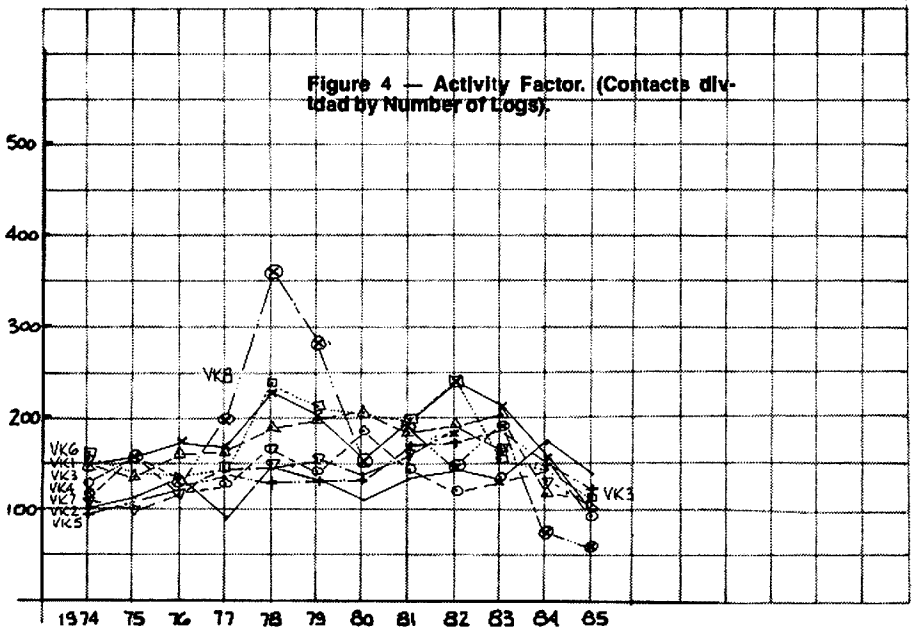

Figure 4 — Activity Factor. (Contacts divided by Number of Logs).

TABLE 2 — RD CONTEST POINTS PER LOG AND CONTACTS PER LOG ENTERED

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
VK1												
Points per Log	320	288	358	453	511	452	354	197	241	217	160	99
Contacts per Log	147	156	173	159	228	202	158	197	241	217	160	99
VK2												
Points per Log	317	343	271	188	374	352	289	136	143	133	172	142
Contacts per Log	99	110	134	90	144	135	111	136	143	133	172	142
VK3												
Points per Log	343	262	324	303	388	404	421	185	191	206	120	117
Contacts per Log	148	132	160	164	189	197	206	185	191	206	120	117
VK4												
Points per Log	372	433	275	329	443	375	505	145	122	130	147	96
Contacts per Log	126	152	117	127	165	140	188	145	122	130	147	96
VK5												
Points per Log	242	290	286	295	347	364	358	170	175	188	152	124
Contacts per Log	94		122	137	129	135	133	170	175	188	152	124
VK6/9												
Points per Log	379	349	294	437	607	547	526	196	240	152	144	110
Contacts per Log	152	137	133	142	235	212	204	196	240	152	144	110
VK7												
Points per Log	286	269	328	482	421	449	390	164	185	168	131	110
Contacts per Log	107	100	119	144	147	154	136	164	185	168	131	110
VK8												
Points per Log	415		360	822	969	760	408	183	143	191	75	61
Contacts per Log	114		126	197	359	282	151	183	143	191	75	61

Post 1980 scoring was essentially one point per contact

TABLE 3 — RD CONTEST RAW SCORES = PARTICIPATION FACTOR X ACTIVITY FACTOR

AR Reference	1974 Nov 74	1975 Nov 75	1976 Dec 76	1977 Feb 78	1978 Feb 79	1979 Feb 80	1980 Nov 80	1981 Jan 82	1982	1983	1984	1985 Feb & Apr 86
VK1	39.4	35.9	29.1	38.6	57.1	75.9	33.9	31.9	28.1	20.1	17.3	17.5
VK2	5.0	4.4	6.7	5.2	5.2	7.0	5.8	3.5	4.0	2.7	3.2	2.5
VK3	6.4	5.5	7.3	6.7	9.1	9.5	7.0	4.6	5.1	4.2	3.4	3.2
VK4	21.4	24.9	30.0	25.3	20.6	14.5	15.7	8.2	5.8	4.3	3.9	2.7
VK5	33.3	21.8	33.2	33.3	21.3	32.0	25.0	24.8	24.4	22.4	14.3	9.6
VK6/9	22.3	19.3	19.6	33.8	32.0	32.9	33.3	28.5	28.4	17.5	10.4	9.0
VK7	19.5	18.5	20.0	26.5	37.1	49.7	41.8	39.2	25.4	15.5	8.9	5.0
VK8	28.7	N/A	24.1	N/A	13.1	28.1	5.3	5.3	7.7	11.4	2.8	.7

RADIO AT THE GAMES

During early August 1986, the Korean Amateur Radio League Inc (KARL) has been granted permission to install radio facilities in the Olympic site for the purpose of enabling KARL volunteers to provide traffic service for competitors at the games. The Korean Administration has also authorised all visiting competitors and officers of games who possess amateur licenses to make QSOs from the radio facilities available at the Olympic site.

In an effort to help achieve a high status for radio amateurs around the world by its support of amateur radio at the 86 and 88 Olympics, the Administration plans to issue temporary operating licenses to those visiting competitors and officials from all countries including those which do not have reciprocal agreements with Korea.

All visiting amateurs are advised not to take any type of portable transceivers, including handhelds, into the Republic of Korea, as the use of portable radios by amateurs is prohibited.

To commemorate the occasions, the following special stations will be operating during the games period.

86 Asian Games — 6K86AG
88 Seoul Olympic Games — 6K88SOG

During the games period, individual HL stations will use the suffix of 86 for the Asian Games and 88 for the Seoul Olympic Games.

Contributed by Young Soon Park HL1IFM, President, KARL

NEW NAME, NEW NUMBER!

The Australian Coastal Surveillance Centre is now known by the title *Federal Sea Safety and Surveillance Centre*. Telephone numbers are as follows:

Coastwatch (Emergency unusual or suspicious marine or aircraft activities in coastal areas — (062) 47 6666 — (Free STD call or reverse charges)

Search and Rescue (Sea Safety) — (062) 47 5244

Contributed by Alan Hawes VK1WX

RD CONTEST SCORING — cont from previous page

TABLE 4 — RD CONTEST ACHIEVED WEIGHTING FACTORS

VK1	1.00	1.00	1.12	1.00	1.00	1.00	1.23	1.23	1.01	1.11	1.00	1.00
VK2	7.88	8.16	4.89	7.39	10.90	10.80	7.28	11.20	7.10	8.30	5.38	7.00
VK3	6.16	6.53	4.48	5.73	6.30	8.00	6.01	8.59	5.60	5.33	5.05	5.47
VK4	1.84	1.44	1.09	1.52	2.77	5.22	2.67	4.77	4.90	5.21	4.41	6.48
VK5	1.18	1.65	1.00	1.16	2.68	2.37	1.67	1.58	1.20	1.00	1.21	1.82
VK6/9	1.77	1.86	1.67	1.14	1.78	2.31	1.26	1.37	1.00	1.28	1.66	1.94
VK7	2.02	1.94	1.64	1.46	1.54	1.53	1.00	1.00	1.12	1.45	1.95	3.50
VK8	1.37	N/A	1.38	N/A	4.40	2.70	7.90	7.39	3.69	1.96	6.20	23.90

PROJECTED WEIGHTING FACTORS FOR 1986

VK1	1.1	VK5	1.4
VK2	7.5	VK6/9	1.5
VK3	5.9	VK7	2.2
VK4	6.2	VK8	6.2

GOOD NEWS FOR TWO-LETTER CALL SIGN HOLDERS

The Federal Office has received several complaints from members that two-letter call signs were difficult to find when embedded amongst the three-letter call signs in the 1985/86 Call Book.

The call sign listing was prepared on the WIA computer where all sort- programs do a straight ASCII sort. This leaves the two-letter call signs in an alphabetical form amongst the three-letter calls.

New programs have been written that will sort by length of call sign, hence the 1986/87 Call Book will have the two-letter calls preceding the three-letter one.

At the 1986 Federal Convention, Council resolved that WIA members should be identified as such in the Call Book. This will be done in the 1986/87 Call Book by placing a symbol before the call sign of WIA members. We apologise in advance to any members whose second call sign may not be identified correctly.

CONVERSION OF THE PYE OVERLAND FM-738 TO SIX METRES FM

With the disappearance of Channel 0 in the Melbourne area, this should provide an ideal climate for an increase in six metre activity, particularly the FM net frequency on 52.525 MHz.

Ian Keenan VK3AYK
6 Pretoria Street, Caulfield South, Vic. 3162

Through disposals outlets, there have been available at various times, the Pye FM-738 which is eminently suitable for conversion to six metres.

Before conversion, give the unit an external visual check to ensure that everything is in order, etc.

LOW PASS FILTER

Remove the two 10 pF capacitors and replace them with 33 pF capacitors. Next remove the 30 pF capacitor and replace it with a 68 pF capacitor. Good quality ceramic high voltage types should be used (630 volts).

TRANSMITTER MODIFICATION

In order to reduce the work associated with the transmitter exciter board, the transmit crystal formula is changed from divide by 24 to divide by 16. This places all tuned circuits in the exciter within the tuning range of the new frequency.

Turning now to the main transmitter chassis, pad both the primary and secondary of T203 with a 22 pF disc ceramic capacitor (630 volts). Rewind the plate coil of V1B with 12 turns of 18 gauge enamelled wire, the same diameter as the original coil. Rewind V2's grid coil with six turns of 18 gauge enamelled wire, also the same diameter as the original coil.

Finally, rewind the PA (V2) plate with 14 turns of 18 gauge enamelled wire the same as the original diameter.

TRANSMITTER ALIGNMENT

Disconnect R211 (47 ohm) from PA screen pin 7 and connect a power meter to the aerial socket. Screw the slug T11 so that it is flush with the top of the can then screw the slugs of T12 and T13 until the bottom ends of the slugs are flush with the printed circuit board.

Screw the slug of T202 flush with the bottom of the can, then screw the top and bottom slugs of T203 to either ends of the former.

Insert a 3.282.81 kHz D-style series resonant crystal into the crystal socket. Place the positive lead of a DC volt-meter (2.5 volts) to TPX and the negative lead to the negative supply (chassis).

Adjust T11 for maximum (a slight peak). Move the meter to TPY and adjust T12 for maximum indication, then repeak T11 for maximum. Move the meter to TPZ (circuit board under chassis) and peak T13 for maximum.

Place meter on pin 4 of test socket (below aerial connector) and adjust the slug of T202 for maximum indication. (Place the positive of the meter to the chassis and the negative to pin 4). Next readjust T13 for a peak. Move meter to pin 5 of test socket and adjust bottom and top slugs of T203 for maximum.

Transfer the meter to pin 7 and adjust C220, C221, and C222 for maximum. Keep C221 and C222 equal in capacitance. Reconnect R211 (PA screen resistor) and adjust C224 for maximum output into the power meter, then repeak C220, C221, C222, and C224, together with the PA coupling link into the power meter. This may have to be repeated several times and depending on the age of the valves, 15 to 25 watts should be obtained.

Final tuning of the valve stages should be done with the unit sitting on the top cover or a metal place to allow for detuning of the high power stages when the radio is finally placed into its cover. When tuning is completed, momentarily remove the transmit crystal and output should fall to zero. Then net the transmitter crystal and set the deviation to about 5 kHz. This can be done with the help of another station, off-air (RV1).

RECEIVER MODIFICATION

Once again, to simplify modifications, the crystal formula is altered to inject on the high side of the carrier frequency.

$$\text{Receiver Crystal Frequency} = \frac{\text{Operating Frequency} + 10.7}{2}$$

Gently remove the cans from the front end coils. Solder a 10 pF ceramic capacitor across L1, remove the 10 pF capacitor from across L2 and replace it with a 22 pF Remove the 10 pF from L3 and solder a 22 pF in its place. Remove the remaining 10 pF from across L4 and L5 and place a 22 pF capacitor across L4 and L5.

RECEIVER ALIGNMENT

Insert a 31612.5 kHz series resonant D-style crystal into the crystal socket and, with a suitable high impedance RF AC meter connected across the socket, adjust the series crystal coil for maximum reading. With a DC multi-meter on the 2.5 volt range, connect the positive lead to TPZ (next to C25 on the main board) and the negative lead to the negative supply, and adjust L6 for maximum reading. Then connect the meter to pin 1 on the test socket (signal/strength indication). Connect a signal generator, tuned to 52.525 MHz, via a two turn coupling link to L5 and tune L5 for maximum signal. Repeat for L4. Next, connect the signal to the aerial connector and adjust L1, L2, and L3 for maximum reading, reducing the signal generator level as required. Carefully refit all the front end cans and repeak L5, L4, L3, L2, L1 and L6 several times for maximum signal.

When complete, if you are able to measure the quieting it should be 20 dB for .5 uV PD input or better.

Finally, net the receiver crystal by placing the meter on pin 3 of the test socket and, with a signal known to be on frequency, adjust the series crystal coil slug for zero volts on the meter.

So, there it is — the conversion is not difficult and can be done in a couple of hours. I look forward to hearing you on six metres!

EDITORIAL NOTE: Due to space limitations, the circuit diagrams cannot be reproduced here. Those requiring copies for their personal use may obtain them from the WIA Federal Office, PO Box 300, Caulfield South, Vic. 3162, on request accompanied by a business sized SASE.

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SPACE STATION

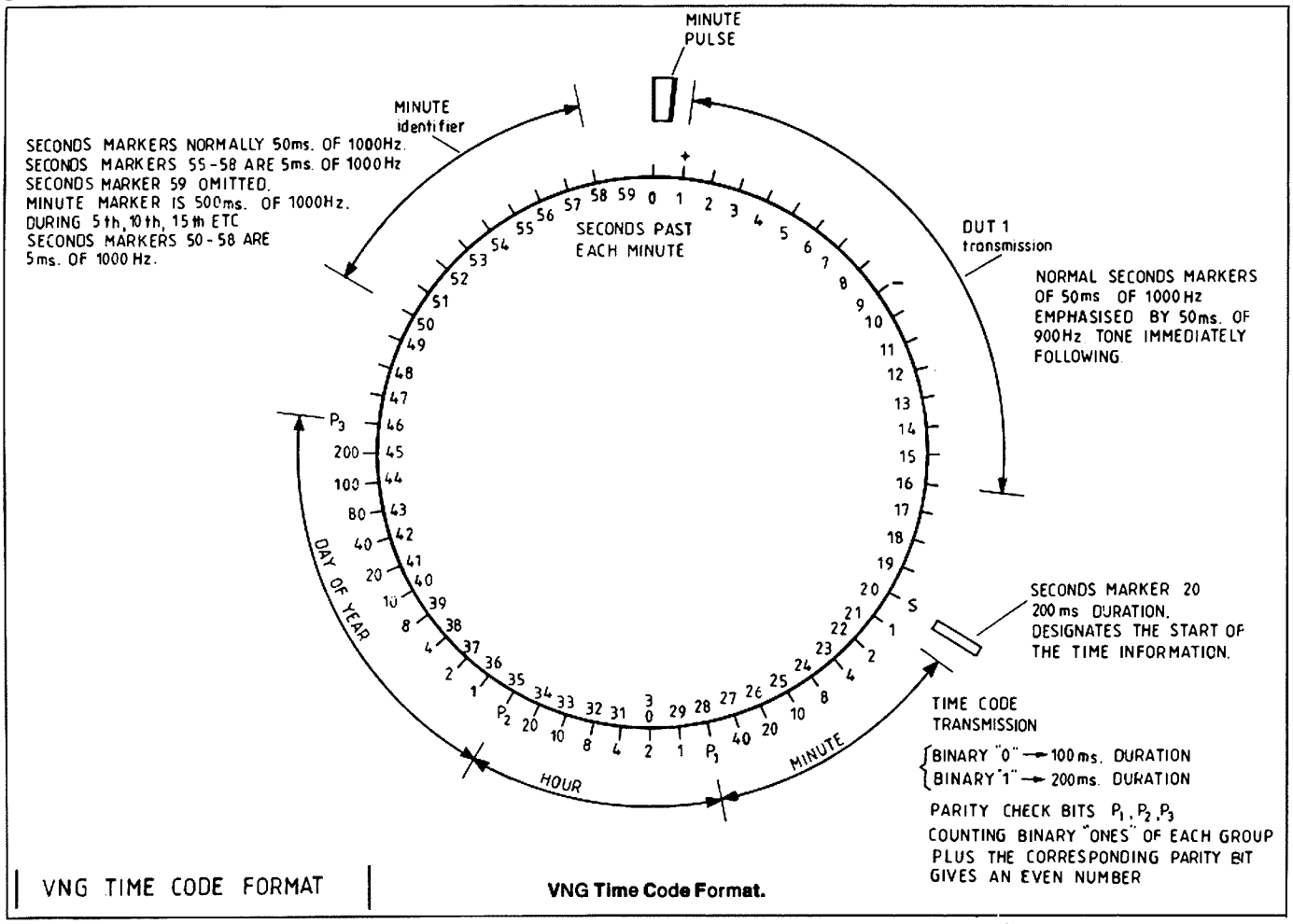
The Soviet Union has a Space Station, Mir, which was launched on February 9. The station has been heard in Canada on 143.625. Other frequencies reported to be in use are 121.750; 142.400; 142.417; 142.600; 143.144; 143.825; 166.000 and 192.040 MHz.

From *CRRL News* April 30

Novice Notes

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

NEW TIME CODE FOR VNG



VNG Time Code Format.

A short wave standard frequency and time signal broadcasting service VNG has operated from Radio Lyndhurst, Victoria, for 20 years. Telecom Research Laboratories were responsible for the establishment of the service and continue to maintain the carrier frequencies and instant of time, as transmitted, to within close tolerances of the Telecom (ATC) Standard of Time and Frequency operated at the Clayton Laboratories complex.

An updating of the broadcast time code format has been implemented which adds time of day and day number of the year information without alteration to the existing minute, five-minute and 10-minute identifying sequences or DUT1 coding. The DUT1 Code relates the deviation between the Earth's angular position time scale UT1 and the Co-ordinated Universal Time Scale UTC.

The addition of this extra information in binary-coded-decimal (BCD) form, will enable time code receivers to operate directly from the received signal by decoding the pulse sequences and updating a receiver's time output completely every minute.

For maximum security under marginal reception conditions, the so-called "slow code" at a bit rate of one Hertz has been adopted, the complete information thus extending over most of one minute. The low transmission rate also permits decoding by the use of simple recorders.

As VNG has Australia-wide coverage, the upgraded time service will have many new applications where HF radio reception is the only convenient source of accurate time information. Such applications include surveying, data logging, telemetry systems and shipping.

The method of encoding used complies with CCIR recommendations for Time Codes and is similar to the "slow codes" transmitted from the standard frequency and time signal stations MSF at Rugby in England and DCF77 near Frankfurt, West Germany.

The new code has been on air since May 14, 1986 and has created renewed interest in the VNG service provided by Telecom.

QSP

REGION 2 Conference

In commemoration of the IARU Region 2 Conference, which will be held in Buenos Aires from October 20-25, 12 local radio clubs in Argentina will be operating special event stations signing AZ1ARU/1; AZ1ARU/2 ... AZ1ARU/12. The operations will continue until October 31.

QSL cards for AZ1ARU/5 should go to LU6FAZ. QSL information for the other 11 stations is, as yet, unknown.

From *The ARRL Letter* May 23, 1986

WHAT TIME IS IT?

There are many interesting stations to listen for when you want to catch the time: WWV from Fort Collins, CO on 2.5; 5; 10; 15; and 20 MHz — WWVH from Hawaii on 2.5; 5; 10 and 15 MHz — JJY from Tokyo on 2.5; 5; 8; 10 and 15 MHz — CHU from Ottawa on 3.330; 7.335 and 14.670 MHz — VNG from Lyndhurst, Australia on 4.500; 7.500 and 12.000 MHz — OLB5 from Czechoslovakia on 3.170 MHz — VWC from Calcutta on 12.744 MHz — and DOA from the Federal Republic of Germany on 2.775 and 12.763 MHz.

From *The ARRL Letter* May 23, 1986

NOVICE LICENSING INTO THE 21ST CENTURY

A Discussion Paper

G S Bracewell VK3XX

At the 1982 Federal Convention it was determined "at this time" that extension of Novice facilities was not an appropriate policy to pursue. However, it was moved at the 1986 Federal Convention that steps be taken to address Novice access to the VHF/UHF spectrum prior to or in conjunction with consideration of the direction of amateur radio into the 21st century. This motion was unanimously carried by the Federal Council.

Since 1982 there has been an "explosion" of interest in the community in micro-computing, and in the ranks of radio amateurs in particular. Typical applications being:

to aid design calculations in amateur projects
to provide data base facilities for contests and logging
to calculate beam headings and distances for world-wide communications
to track amateur and other satellites
to enable the amateur to encode and decode high speed data communication.

It has been stated by Messrs Linton and Harrison that the Amateur Service needs to attract younger participants and that computer hobbyists represent a potential target for recruitment. While it is the opinion of the writer that this potential has been overstated it is not denied that some potential does exist. Such people would see the opportunity to extend their world of "keyboard" communication via the public telephone network to communication by radio.

To exploit that potential it has been suggested in the same paper that an entry into amateur radio by way of a lower level of examination to those currently available be sought. Many members of the WIA have expressed views against lowering the technical standard of entry as "numbers" should not be the criterion on which the success or otherwise of the hobby is judged. With three levels of amateur licensing in Australia already the DOC principle of "let the user pay" has crept into the examination structure and is making it economically unattractive to young people to consider amateur radio as a hobby when home computing, for example, incurs no cost beyond equipment and certainly no requirement for formal study and examination.

It is, therefore, postulated that the lowest entry into amateur radio should always be by way of the Novice licence. However, since its inception in the 1970s amateurs have felt strongly that there must always be an incentive to upgrade to either Limited or Unrestricted licences. Consequently, there has been reluctance to consider widening the scope of the facilities available to Novices.

Considering the wide technical scope of the Novice Examination syllabus, effectively examined at an appropriate level by the present range of multi- choice questions, there is relatively little benefit to be perceived beyond the facilities available in the Citizens Band Radio Service. The CBRS already permits operation, without qualification by examination and at lower licence cost, using:

AM and SSB on 27 MHz and
FM on 470 MHz, including use of repeaters.

There may be pressure by the CBRS for DOC to authorise digital communications on 470 MHz once it is recognised that suitable equipment is commercially available. This would provide an alternate path for the computer hobbyist interested in digital communication by radio, to the detriment of amateur radio.

In giving consideration to reciprocal licensing with Japan, where a "no- code" telephony licence exists, the DOC are proceeding on the basis of offering a VHF only, 10 watt power licence to such a Japanese operator. With de-regulation of modes and bandwidths above 50 MHz one can assume that this licence will permit digital modes as well as telephony. This proposal is contrary to the wishes of many members of the WIA but is being pursued by DOC on a limited time basis (12 months) as for the existing visitors' licences. It will therefore not be a true reciprocal licence for permanent or extended-stay residents of Japanese origin.

In view of these factors the WIA must now look toward seeking expansion of Novice facilities. Not every Novice wishes to, or is capable of, upgrading their licence. Operation within present mode and frequency limitations will eventually cause enthusiasm to fade and there could be a loss to amateur radio of those, who "having been there, done that" see little challenge available to them without further study and formal examination.

PROPOSED EXTENSION OF NOVICE PRIVILEGES

Perhaps the time has come to open up the VHF/UHF amateur band spectrum to the Novice operators.

Currently, the syllabus is orientated toward CW, AM, and SSB operation and these are the only modes available to Novices. It is proposed that extension of privileges should involve the introduction of FM techniques into the syllabus at an appropriate level. Some may say this will make the Novice examination harder to pass and be a further hurdle to entering the ranks of the amateur service. Such a reaction is more likely to be emotional than significant.

Having introduced this additional technical topic, there is then justification for Novices to be allowed FM telephony, and digital communication using AFSK, FSK and similar techniques. Examination in the associated digital technology and software is really no more appropriate than examination in speech! The Novice then requires space to practice this new found art and, except for RTTY at 45/50 Baud, the 3.5 MHz band is certainly not the place.

The amateur service has many under-used megahertz at its disposal in the VHF and UHF spectrum. Much of this is coveted by professional radio services. If it is to be retained by the amateur service it must be seen to be utilised. What better prospect of increasing the occupancy of those frequencies than opening them up to the Novices? It might even permit SSB contacts on 70 cm without having to make prior arrangementsi

At present DOC are tending toward greater deregulation of the amateur service, with particular reference to frequencies above 50 MHz. Consequently, it is now appropriate to assess their reaction to new Novice initiatives from the WIA.

WHAT AND WHERE?

Assuming that consent to this proposal is received then we must decide what to seek from DOC in extended privileges for the Novice operator. Arriving at consensus is likely to be more difficult than getting agreement from DOC (or sorting out the tax system!).

One factor will involve little argument, namely authorised power. There is no justification for seeking power more than current Novice level on the HF bands.

Given the proposed addition to the Novice syllabus, there is no logical reason why all the emission modes allowed to Limited and Unrestricted licensees should not be allowed to Novices. There could be philosophical objections to pulse and television modes but in practice truly "novice" Novices are unlikely to become involved in the more "hi-tech" modes and yet not be sufficiently motivated to upgrade their licences.

Frequency allocation will probably provoke the most heated debate. We have been used to the principle that novices be given a limited frequency allocation in the MF and HF region. Agreement is unlikely that this should change, particularly on the 3.5 MHz band. The philosophy of a limited Novice segment being allocated to overlap the CW and telephony sections (as defined under earlier band planning) of the bands gave the opportunity for Novices to communicate with Unrestricted licencees on both modes. However, band planning in the VHF/UHF spectrum precludes application of the same philosophy without more than one Novice allocation per band to take advantage of the wider range of transmission modes which will then (hopefully) be available to the Novice operator.

There is, therefore, a strong incentive to open up the VHF/UHF bands in their entirety with perhaps a reservation in respect of six metres. Does this appear as heresy to the Limited and Unrestricted operators? It really should not, because the restriction to a mean power output of 10 watts does provide a clear distinction between the Novice and the higher grades.

In seeking to arrive at consensus one or two other factors need to be considered.

What about six metres where power restrictions, based upon geographical location, will apply to all operators in the 50-52 MHz region?

Is two metres too crowded to accommodate Novices?

What about 10 metres if FM is to be allowed to Novices and repeater operation is approved for this band?

Why should Novices not have access to the Amateur satellites?

Because of limitations in the 50-52 MHz section of six *metres* it would seem inappropriate to propose allocation here at least until other usage permits amateurs throughout Australia to have the same privileges. A Novice allocation of 52-54 MHz would enhance activity on all appropriate modes in this section of the band according to the Australian Band Plan and would provide a transition ground between HF and VHF techniques for the novice interested in construction and experimentation.

Is the two metre band too crowded already? Maybe some of the repeaters are over-loaded but then some others are rarely used. Some of the dedicated simplex frequencies may seem to be well used but in reality, even in cities like Melbourne and Sydney there is much open space on two metres particularly at the low frequency end where there is virtually no CW actively except EME and relatively little on SSB. One thing which has become apparent in Europe with the huge increase in VHF-only licences in recent years is the ability to observe band openings. We must be missing many DX opportunities due to the low level of activity in Australia, most being local FM communications.

So what about 10 metres? Is there any logical reason why the Novice should have an upper frequency limit of 28.600 MHz? No debate is entered into in respect of 28.100 MHz and below. Even at times of the sunspot cycle when good propagation over long distances is possible on this band, there is still no real congestion above 28.600 MHz (at least there are not too many VKs there).

Is there any reason to believe that Novices will be any less gentlemanly than others in respecting the satellite downlink portion of this band?

Given 10 metre FM repeaters why should Novices be denied their use? With the introduction of FM into the syllabus this could be a "shot in the arm" for 10 metres and help to justify efforts being made to introduce repeaters to this band either for in-band operation or for cross band "gateway" facilities.

At present the Novices are unable to access any of the amateur satellites. Even when one of the RS series goes into service with its uplink on 21 MHz (mode K) there is a distinct possibility that it will be outside the novice allocation. Yet 10 watts on two metres is an ideal power level for satellite operation with the circular orbit satellites on the Mode A uplink.

AND WHAT ELSE?

In the interest of making a licence slightly more

easily available to computer hobbyists what about a VHF only novice licence without the code test? This would not require any additional DOC cost for special examinations. Such a licence could perhaps be called a Limited Novice Operators Certificate (LNOCP).

The overall Australian licensing structure would then be:

Full Power 120W Mean 400W PEP	Low Power 10W Mean 30W PEP	
AOCP LAOCP	NAOCP LNAOCP	HF/VHF/UHF VHF/UHF

Since the principle of a "no-code" VHF licence already exists why not extend this to the novice at his power level?

CONCLUSION

There can be no over-riding reasons for operators in the amateur service to reject the concept of Novice VHF/UHF operation. To do so would perpetuate low occupancy of the VHF/UHF spectrum and risk ultimate loss to professional interests. We may even be able to sustain a few VHF contests as in Europe — short term contests in contrast to the Ross Hull, which only satisfies the dedicated few with free time over the relevant period.

The proposals cannot be said to degrade the technical standards of the amateur service in Australia and yet they remove the daunting code test for a computer hobbyist who might otherwise attain the Limited Novice certificate.

In any case, as we are looking toward the 21st Century how long will CW survive? Will the newcomers continue the tradition notwithstanding it being the most effective mode of communication or will it wither and die with the present generation of amateurs?

What a misleading and anachronistic term is CW? Misleading because so called continuous wave is broken up into dots and dashes and anachronistic because who refers to a continuous wave in any other context today? It is a digital mode dependent upon the human mind for encoding and decoding intelligence which will ultimately be replaced by the computer generated digital modes which are almost as good for communication in marginal conditions but don't supply the oft expressed entry filter into amateur radio.

Let the WIA know your wishes for the future of the Novice licence.

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QSP

HOUSEKEEPING CRASHES

After nearly three years of on-orbit performance, AO-10 has suffered a serious, if not fatal, malfunction. The central computer, or Integrated Housekeeping Unit (IHU), experienced a major malfunction on May 17, when users began to notice some odd symptoms. The telemetry mode did not switch from PSK to RTTY or CW. Also, the Mode B transponder was locked on during a perigee passage. This put the satellite in a catatonic state.

It appears partial repairs can be made but longer-term prospects are somewhat more clouded.

Analysis of the fault is proceeding with experts from around the world considering the symptoms. Most are convinced the problem was caused by solar or cosmic radiation. The 16 k-memory chips are susceptible to the debilitating effects of exposure to radiation. The effects are cumulative so an overall degradation of the memory is suspected.

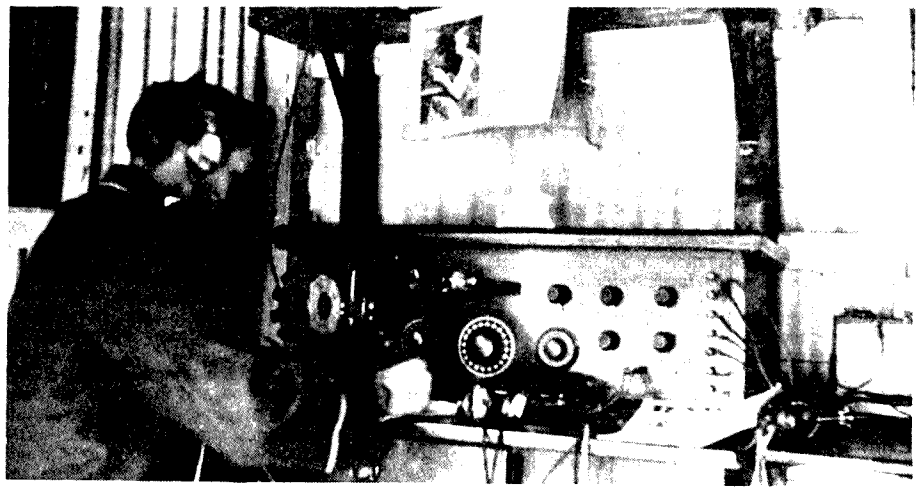
Karl Meinzer DJ4ZC, President of AMSAT-DL, a prime mover in the Phase 3 Project, says the current problem is survivable and there is a reasonable chance many functions can be restored.

Karl hastens to add that the current fault is the harbinger of a new class of problems AMSAT will be seeing more often. It is emblematic of the inevitable degradation of the memory.

Condensed from *The ARRL Letter*, June 6, 1986

Thumbnail Sketches

Alan Shawsmith VK4SS
Queensland Historian
35 Whynot Street, West End, Qld. 4101



HERBERT PETER CHRISTIAN LARSEN — OA/VK4JW (SK)

Records disclose that a nest of experimenters were active in the Charters Towers, Cairns and Townsville areas of north Queensland between the early and late 1920s. There were some seven or eight in total and only four of them appear to have been fully licensed at that time. One of the latter was the late Herbert Peter Christian Larsen OA4JW — and, from anecdotal stories received, he was something of a character.

Herb is remembered in the north as the instigator of the Nor'West Rock Crushers Club. Speculation as to the significance of this title remains to this day; one suggestion being that the club members were the first to use crystal controlled rigs, another that they had a common interest in mining. In its day Charters Towers was one of the richest gold mining towns in Queensland. In 1872, with a population of 31 000, it boasted 40 public houses (pubs)!

He had a reputation for enjoying an occasional glass of ale; in fact, it could be said that he had it permanently on tap, as he worked at the Charters Towers Brewery. Endowed with the call sign VK4JW, one wonders if he was ever dubbed "Four Johnnie Walker."

An extract from Herb's log, that has been carefully preserved for posterity, shows that he was one of the few amateurs to pick up the transmissions from Sir Charles Kingsford Smith's *Southern Cross*, on the last leg of its dramatic trans-Pacific flight in 1928. Herb's log (when still an SWL) verifies the claim of Tom Elliott 4CM, that 'Smithy' experienced extremely bad weather and was in some difficulty because of it.

Herb obtained his AOCP No 439, on September 25, 1928 and was licensed as OA4JW. The Townsville Amateur Radio Club advises that it is the oldest licence held in its records. The club also has extracts of his log, as well as photographs and other papers. VK4JW became a full member of the WIA in 1936.

One of the accompanying photographs shows Herb sitting at an extra large broadcast band receiver, so large that one wonders if it was a home-brewed unit. The other is a reproduction of his proper rig. Note the one tube transmitter, at right, standing above a hefty power supply.

Information and photographs supplied by Evelyn Bahr VK4EQ, TARC Historian

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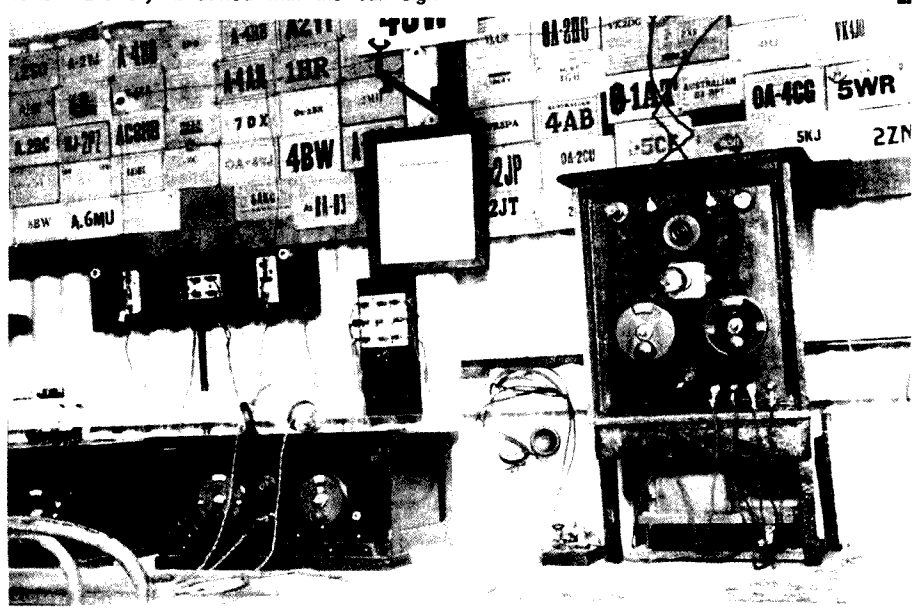


Equipment Review

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

KENPRO KT-220E TWO-METRE HAND-HELD TRANSCEIVER

The two-metre FM hand-held transceiver must be a popular market. Here is yet another one to compliment the several already available through local outlets. Kenpro products have been available on the local scene for many years and they are well-known for antenna rotators and ancillary amateur equipment. I am not sure if Kenpro are related to the original Ken Company who produced the first two-metre hand-held, sold in this country many years ago, the famous KP-202.

The subject of this review, the KT-220E, is marketed in the USA under the Santec brand and is known as the ST-20T.

Well, let us look at the KT-220 in detail to see what it has to offer. It is a handy size, being just a little longer than the well-known Icom IC-2. The width and depth are about the same. The actual measurements are 18 x 4.5 x 6.5 cm (HDW). The weight is 550 grams compared with 525 grams for the IC- 2.

It is interesting to note that the battery pack of the Kenpro is inter- changeable with the Icom, although the standard battery supplied with the KT-220E is a 9.6 volt unit as against the smaller 8.4 volt IC-2 power pack.

The Kenpro has all the features of the opposition plus a few more. Frequency selection is via a 16 button key-pad. A LCD readout displays transmit and receive frequency, memory or non-memory operation, scan stop mode, repeater offset and a clock. The top control panel has audio volume/power on/off, squelch, external microphone speaker outlet, high/low power selector, external 13.2 volt power input socket and the indispensable adjunct for the enthusiastic two-metre operator, an S-meter.

The side panel has the PTT bar, a button to actuate the S-meter/LCD display illumination, a slide switch to lock the frequency control panel and a battery release button.

Frequency coverage is from 144 to 148 MHz in 5 kHz steps with an overlap at each end of the band. There are 10 memories which can be programmed with the required offset. Four scan modes are available, the first stops on a signal as determined by the centre zero detector, and then holds for 15 seconds before resuming scan.

The second mode stops on the first signal found and stays on that frequency. The third, like the first, stops but does not resume the scan until the transmission stops and the fourth is the memory scan which can be programmed to skip any of the selected memories not required at that time. A manual scan is also available with up/down buttons.

With the standard battery, power output is rated at 3.5 watts on high power selected, 0.5 watts on low power. Output can be increased to five watts using an external 13.2 volt supply which, as mentioned earlier, can be easily plugged into the top panel connector.

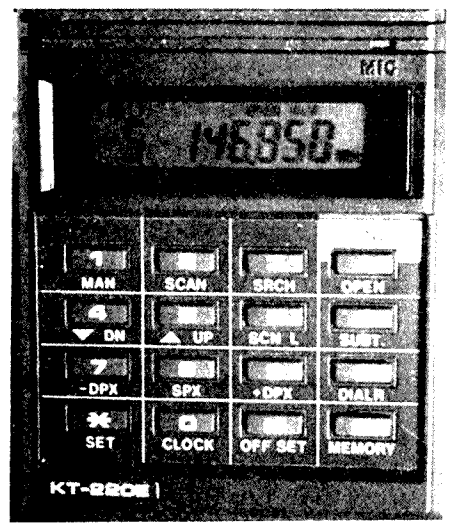
The KT-220E is supplied with a flexible stubby antenna, a belt clip, a wall plug-type battery charger, a selection of connector plugs, an earphone and instruction book.

ON THE AIR

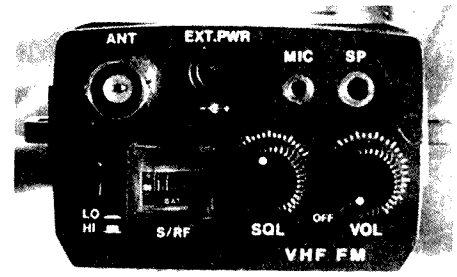
As with any key-board controlled transceiver, the operation of the KT-220E takes a bit of practice. Most of the buttons have double functions with the secondary function becoming available through the 'A' or function button. In the manual mode, most required frequencies can be selected by entering one or two figures and then pressing the set button. For example, enter 65, press set and you are on 146.500 MHz. You can, of course, enter the frequency by dialing in each number in turn if you have plenty of time.

With the frequency and offset selected, its just a matter of pressing the function A' button, the memory button 'D' and required memory channel number, eg '9' and there you are. Be prepared to sit down for an hour or two to sort it all out. The instruction book is reasonably well written in this respect.

Received audio quality from the in-built speaker is good with a crisp sound, but like most hand-



Keypad.



Top View of the KT-220E.

helds is somewhat down in power output. With a good quality external speaker connected, both the quality and output level were good.

Transmit audio was reported as very clean and clear quality. Kenpro do offer an external speaker microphone as an option, but this was not available to test, however, again coincidently, the Icom HM9 speaker/microphone worked very well with the Kenpro. I often get the impression that most Japanese manufacturers buy in many of their components from the same source. In other words, I do not think that Icom, Yaesu and Kenpro make their own brand of microphones. Stick a label on it and it turns into whatever brand is wanted.

A light is provided to illuminate the S-meter and LCD display. It works quite well for the meter but is useless for the display, just where it is needed most.

The keyboard buttons have a soft rubbery feel. I noted that at times one of them had a tendency to stick in and while this did not seem to effect operation, it might be interesting to see if this becomes a problem in the future. Also, the buttons are rather small. I found that they were better operated with the finger nail rather than the finger.

UNDER TEST

Perhaps one of the more important tests with a battery powered hand-held transceiver is the current drain. I carried out two series of tests to check this, one with the normal 9.6 volt battery connected and the second using 13.8 volts from an external power supply. The results with the resultant RF power output were as follows:

9.6 volts power output	(high)	3.5 watts 600 mA.
	(low)	0.5 watts 350 mA.
13.8 volts power output	(high)	5.0 watts 800 mA.
	(low)	0.5 watts 360 mA.

The power output figures are right on specifications. The current drain is fairly high for the 250 mAh battery so you would need to keep overs fairly short. With 13.8 volts connected, a full five watts output is available, well within the ratings of a simple one amp power supply.

I next measured the battery drain on receive. With the receiver squelched and no audio output, the drain was 75 mA. At full audio output with no audible distortion, it was 180 mA. Again, it is a case of keep the volume as low as possible for extended battery life.

Power output and audio distortion was next checked. Feeding an eight ohm terminating audio watt meter, and a noise and distortion meter, the following results were noted. There was 10 percent distortion at 375 mW, 30 percent distortion at 450 mW.

This indicates that the total audio output is rather limited. At low volume, it sounds fine but if used in an average car at 80 to 90 km/h you might find it rather lacking. However, as mentioned

earlier, an external speaker can make a big difference.

Receiver sensitivity was checked. At .25 uV the SINAD was 12 dB and at .1 uV it measured 6 dB. The .25 uV figure is right on specifications. The S-meter is naturally rather small. It is calibrated with nine divisions presumably for nine S-points and labelled 1, 3, 5, 7 and 10, which I guess means S9 + 10 dB. Whatever, the following results were noted.

S1	S3	S5	S7	S8	S9
.5uV	.7uV	8uV	10uV	40uV	Not reached

The meter would not go beyond S8, regardless of the signal input. However, it is better than nothing.

On transmit, the meter becomes a volt meter. At the junction of the red and green section on the scale, it is exactly 9.6 volts with 13.8 volts indicated at the start of the red 10 on the S-meter scale. The receiver front end performance appeared to be quite good for a hand-held. While receiving a weak signal of around .5 uV, I injected a strong signal 50 kHz away. It required an input of 10 mV to degrade the signal-to-noise ratio by 2 dB on the wanted signal.

All in all, these figures are very reasonable for a two-metre hand-held transceiver. The only point of criticism is the low receive audio output, but even that is not too bad.

INSTRUCTION BOOK

The book runs to 26 pages. It is well written and contains a lot of useful information. The circuit diagram is spread over four pages while printed circuit layouts cover anotner tour. A page of trouble shooting hints mainly cover operating problems.

The actual operating instructions are good. Flow charts show how the various functions are programmed.

Thanks to Emtronics of Sydney and Melbourne for the loan of the review transceiver. Further inquiries should be directed to them or refer to their current advertisement in *Amateur Radio* magazine.

EVALUATION AND ON-AIR TEST AT A GLANCE

APPEARANCE

Packaging
*** Strong carton with foam inserts.

Size
*** Not the smallest full featured HT, but very good.

Weight
*** Again not the lightest, but very good.

External Finish
*** Very clean and presentable finish.

Construction Quality
*** Good internal wiring and construction.

PANEL CONTROLS

Location of Controls
*** Key-pad and top panel controls well located.

Size of Knobs
** For a hand-held, quite large. Keyboard buttons rather small.

Status Indicators
*** All built into the LCD readout. Transmit, receive, offset, memory, scan, battery alarm.

S-METER AND DISPLAY ILLUMINATION

* S-meter clearly lit but very little gets to LCD display.

RECEIVER OPERATION

Memories
*** Ten memories with repeater offset included.

S-Meter
** Better than nothing. (See test section).

Sensitivity
*** As good as most other hand-helds.

Signal Handling
*** Better than most hand-held transceivers.

Internal Speaker
** Clear distinct quality but output limited.

TRANSMIT OPERATION

Power Output
*** Very good output for most applications.

Battery Drain
** Keep your overs short.

Audio Quality
*** Crisp clean audio.

Metering
** Indicates battery voltage only. No output indication.

MANUAL

Owners Hand Book
** Clear adequate instructions. Circuit and board layouts.

OVERALL RATING

*** if you need a hand-held, this one is worth looking at.

Rating Code: * Poor; ** Satisfactory; * Very Good; **** Excellent.**

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MORSE CODE TONE CONVERTER

P J Grigg VK3APG
Lot 441 Glenburn Street, Newcomb, Vic. 3219

This device varies the tone of Morse code from tape or record to suit ones own individual taste.

Also when the play-back speed is varied, the tone remains the same.

A key facility has been included for sending practice Morse.

Rb is selected with no signal input so that Q1 Vc is about 90 mV. This allows for a wide range of input signal level to be handled.

Connect the input of this device to the speaker output of a tape recorder or record player whose volume-control can be set at any point above the threshold of operation.

The unit was constructed on *Vero-board* and placed in a small wooden box with a sloping metal front panel.

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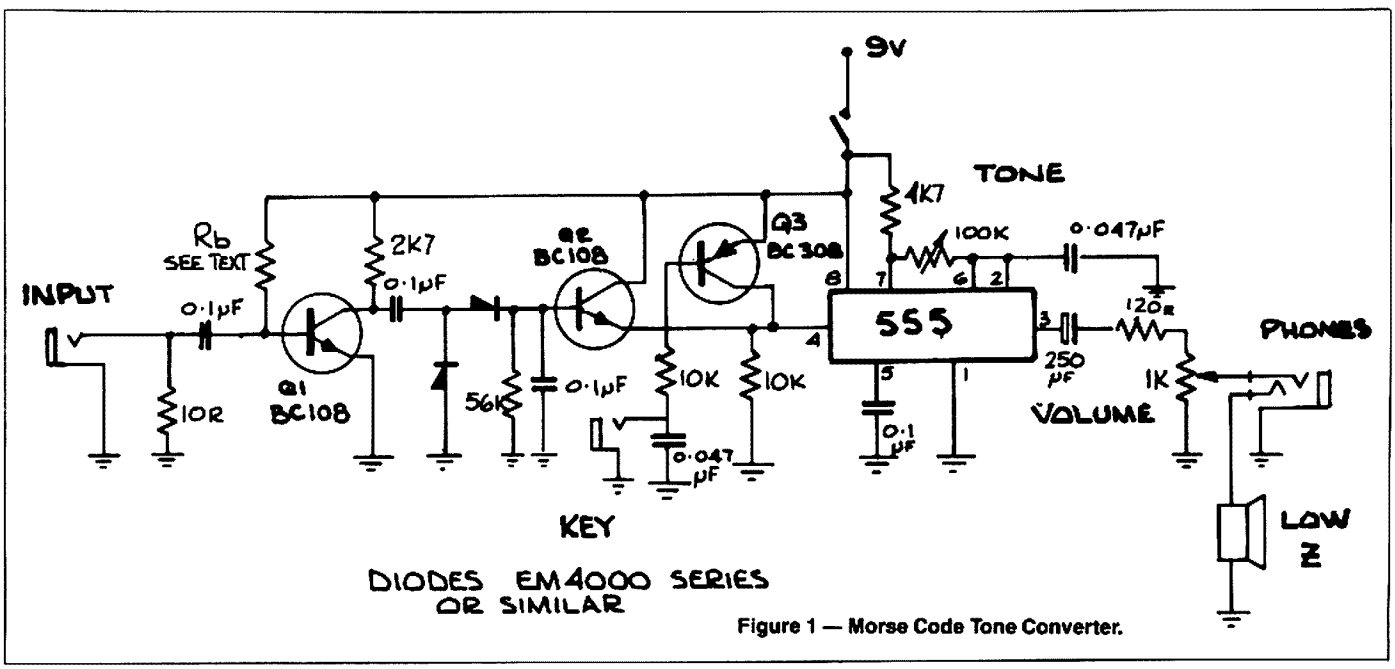

Figure 1 — Morse Code Tone Converter.

KENWOOD'S 25th anniversary celebrated in VICTORIA!

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TL-922	2Kw Linear Amplifier with 2x3-500Z Tubes. **SAVE $200.** Why Pay More?	**$1999**
TM2570	Full 70watts output — latest most sophisticated 2M FM transceiver — no linear needed — **SAVE $36** Plus the cost of linear $250	**$659**
TH21	World's smallest Ultra Compact 2M Hand Held, 1W RF out — High performance low price **SAVE $36**	**$299**
TH41A	World's smallest Ultra Compact 70cm Hand Held 1W RF Out — High performance — low price **SAVE $36**	**$299**
TM411	The Mini Mobile, 25 watts 2M Rig, 5 memo, tilting front panel. **SAVE $40**	**$559**
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THE BRILLIANT NEW PCS-5000 2-METER FM TRANSCEIVER! C-MOS TECHNOLOGY AT ITS FINEST!

The Azden PCS-5000 features unprecedented wide frequency coverage, 20 channels of memory, two separate memory banks with separate or simultaneous scanning, two ranges of programmable band scanning, up to 11 non-standard offsets, built-in PL tone generator, and much more.

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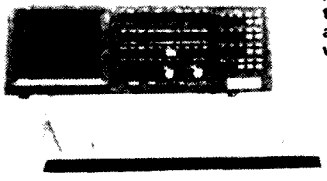
TONO THETA 5000 E



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- AUTO DECODING. Automatically decodes signal and display mode, speed and polarity of the CRT
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- The awesome power of the Theta-777 is limited only by the imagination of the user and the terminal program of the computer

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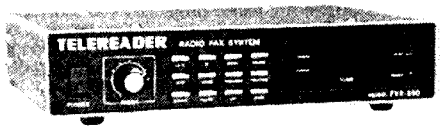
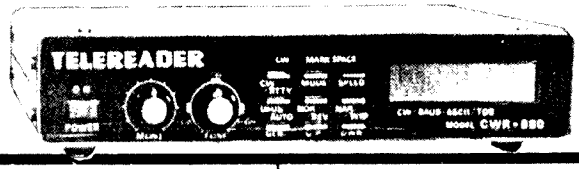


$799

Two New CODE CONVERTERS from TELEREADER

Now you can monitor all short wave services and transmission codes such as CW-RTTY-ASCII-AMTOR and SITOR. All you need is a good communication receiver from EMTRONICS and the whole world of exciting signals is at your fingertips.

CWR-880 with vertical front panel **$599**
CWR-670 with sloping front panel **$599**



DAIWA

CS-401, 4 pos. coax switch	$110
CS-4, 4 pos. coax switch	$49
CS-401G, 4 pos. coax switch	$139
CS-201G, 2 pos. coax switch	$39
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CN-540, SWR/Power meter	$99
CN-410M, SWR/Power meter	$110
CN-460M, SWR/Power meter	$110

POWER SUPPLIES

Alinco EP 3030 30A (25A Cont.)$549
Alinco EP 2510 30A (25A Cont.)$359
Alinco EP 3010 30A (25A Cont.)$459
Alinco EP 1510 20A (15A Cont.)$289
Alinco EP 570 6.5A (5.5A Cont.)$179
Daiwa PS 310M 31A (25A Cont.)$489
Daiwa PS 120M 12A (10A Cont.)$249

RF POWER AMPLIFIERS

HI-120U, 70cm, 100W, GaAS FET
H-60U, 70cm, 60W, GaAS FET
H-725D, 2m/70cm
H-160V25, 160W, 2m
HL-85, 85W, GaAS FET, 2m
HL-66V 6m, 60W
LA-2155E 2m, 150W

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SP-220 SWR/P 1.8 - 200 MHZ	$99
SP-122 SWR/P 1.6 - 60 MHZ	$149
SP-425 SWR/P 140 - 525 MHZ	$189
SP-420 SWR/P 140 - 525 MHZ	$129
SP-350 SWR/P 1.8 - 500 MHZ	$159
SP-250 SWR/P 1.6-60 MHZ	$99
SP-45M SWR/P 140-470 MHZ	$39/$49
CT-15A&N 50W Dummy Loads	$190
CT-20G 2.5 GHZ Dummy Loads	$120
CT-300 250 MHZ Dummy Loads	$49/$69
CH-20A&N Coax Switches	$79
DF-72A 144/430 MHZ Duplexer	$39
TP-05X 50/144/430 MHZ P. Meter	$39
CC-50N 100-1300 MHZ Coax Coupler	TBA

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AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

OSCAR-10 APOGEES
AUGUST 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
0th August										
212	2355	1842:43	-23	207	5	73	43	67	78	49
1st August										
213	2357	1001:47	-19	190	36	70	07	60	85	40
2nd August										
214	2359	1720:43	-17	177	56	63	71	52	90	32
3rd August										
215	2361	1639:51	-19	179	68	55	79	43	95	23
4th August										
216	2363	1558:53	-19	170	77	47	85	35	99	15
5th August										
217	2365	1517:54	-19	161	84	38	90	27	103	7
6th August										
218	2366	0257:26	-19	31e					253	-0
218	2367	1436:57	-19	151	89	29	9e	16	108	-1
7th August										
219	2368	0216:28	-19	33e					257	8
219	2369	1356:00	-19	142	91	21	1ee	10		
8th August										
220	2370	0135:31	-19	317			251	-3	262	16
220	2371	1315:02	-19	132	97	12	105	3		
9th August										
221	2372	0054:33	-19	305			256	5	267	24
221	2373	1234:05	-19	123	101	5				
10th August										
222	2374	0013:36	-19	298	255	2	261	13	272	32
222	2375	1153:07	-19	114	106	-3				
222	2376	2332:09	-19	289	257	10	266	20	277	41
11th August										
223	2378	2251:41	-19	280	264	18	272	29	284	50
12th August										
224	2380	2210:44	-18	270	269	26	278	37	294	58
13th August										
225	2382	2129:46	-18	261	275	34	285	45	308	66
14th August										
226	2384	2048:49	-18	251	281	43	294	54	333	72
15th August										
227	2386	2007:52	-18	242	289	51	307	61	9	74
16th August										
228	2388	1926:53	-18	233	301	59	32e	67	40	70
17th August										
229	2390	1845:55	-18	223	317	68	354	70	59	63
18th August										
230	2392	1804:58	-18	214	341	71	24	67	78	54
19th August										
231	2394	1724:01	-18	204	11	71	46	60	78	45
20th August										
232	2396	1643:03	-18	195	41	66	61	50	84	37
21st August										
233	2398	1602:06	-18	186	66	57	71	46	90	28
22nd August										
234	2400	1521:08	-18	176	80	51	79	42	94	19
23rd August										
235	2402	1440:11	-18	167	97	43	85	31	99	11
24th August										
236	2404	1359:13	-17	159	84	34	90	23	103	3
25th August										
237	2405	0138:45	-17	333					256	1
237	2406	1318:16	-17	143	97	2e	9e	15		
26th August										
238	2407	0057:47	-17	323					260	9
238	2408	1237:19	-17	139	94	18	100	7		
27th August										
239	2409	0016:50	-17	314			254	-1	265	17
239	2410	1156:21	-17	129	99	9	105	-1		
239	2411	2335:52	-17	305			259	6	270	26
28th August										
240	2412	1115:24	-17	120	104	2				
240	2413	2254:54	-17	295	258	3	264	14	275	34
29th August										
241	2415	2214:5e	-17	286	262	11	270	22	282	43
30th August										
242	2417	2132:59	-17	277	267	19	275	30	290	52

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685 MHz — Summer: 7.064 MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305 MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGMENTS

Contributions this month are from Graham VK5AGR, Keith Wilkinson ZL2BJR/JA, Jim Miller G3RUH and Bob VK3ZBB.

OSCAR-10 OPERATING HICCUP

Operators of OSCAR-10 will be well aware of the operating anomalies that were being experienced with the spacecraft's management system and on-board computer. The first sign of real trouble occurred on May 17, 1986 when it was noted that the PSK telemetry had become "corrupted."

For some months past, there has been increasing concern at the number of software errors being experienced by the on-board computer, even more significant, the known number of defunct RAM locations in memory.

For those with good memories you may well recall the events following the extended burn of the OSCAR-10 kick-motor, which placed OSCAR-10 in an orbit with an approximate 3600 km Perigee against a projected 1500 km value. I well remember reading the concerns being expressed at that time as to what effect the belts of high radiation within the unplanned perigee of 3600 km would have on the spacecraft RAM memory. I trust that the damage caused at this time will not be terminal to the spacecrafts computing system, however, only the extensive evaluation currently being carried out by the ground control stations will provide the answer that is eagerly being awaited by many satellite communicators the world over. At this stage, no precise results have been deduced, however, in next month's column, we may be able to provide a more precise assessment of the situation.

OSCAR-10 APOGEES

Due to the nature that the computer program is written to derive the apogee data for this column, there does occur from time to time, a day labelled August 0th or September 0th.

This month is no exception with the anomaly occurring twice. Please do not despair, they are simply another way of printing July 31 and August 31. I am aware of the hiccup in my routine and always intend to correct it, however spare time is one commodity I have been extremely short of in recent months. Next time?

SMOOTHED KEPLERIAN ELEMENTS

The following short article from Jim Miller G3RUH, is commended for your action. The empheris quoted for OSCAR-10 are those to be up-loaded to the spacecraft and used for the next six-monthly period. The Apogees provided in this column are now generated using Jim's smoothed elements sets.

OSCAR-10 SMOOTHED KEPLERIAN ELEMENTS

by Jim Miller G3RUH

It is not widely appreciated that those Keplerian Elements helpfully provided by NASA (Argument of Perigee 123.456789 degrees, etc, etc), are not

OSCAR-10 APOGEES
SEPTEMBER 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
0th September										
243	2419	2052:01	-17	267	273	28	282	39	301	60
1st September										
244	2421	2011:04	-17	258	279	36	290	47	318	67
2nd September										
245	2423	1930:07	-17	248	286	44	300	55	345	71
3rd September										
246	2425	1849:09	-17	239	295	52	315	62	18	71
4th September										
247	2427	1808:12	-16	230	308	60	336	67	44	66
5th September										
248	2429	1727:14	-16	220	327	66	3	68	60	59
6th September										
249	2431	1646:17	-16	211	353	69	30	66	70	50
7th September										
250	2433	1605:19	-16	202	22	68	49	60	78	42
8th September										
251	2435	1524:22	-16	192	44	63	62	53	84	33
9th September										
252	2437	1443:23	-16	183	59	56	71	44	89	24
10th September										
253	2439	1402:26	-16	173	69	48	79	36	94	16
11th September										
254	2441	1321:28	-16	164	77	39	85	28	99	8
12th September										
255	2443	1240:31	-16	155	83	31	90	20	103	-0
13th September										
256	2444	0020:02	-16	330					259	3
256	2445	1159:34	-16	145	89	22	95	11		
256	2446	2339:05	-16	321					263	11
14th September										
257	2447	1118:36	-15	136	94	14	100	4		

quite as accurate as they appear. All those decimal places create a false sense of security.

The Keplerian Elements of 1000s of space object are derived from frequent radar range and range-rate measurements, and are self-consistent to facilitate tracking for a very short time — a few days or weeks.

But satellites like OSCAR-10 are in nice stable orbits, so the elements appear to hold well for quite a while. However, when you take a close look at successive sets of Keplerian Elements, you get quite a surprise.

Take Argument of Perigee; for OSCAR-10 we expect this to change slowly at an average rate of around 0.3 degrees per day — which indeed it does. But carefully plot a graph of Argument of Perigee against time and you will see the points jitter around the steady slope with a variation of some 0.2 degrees RMS. Individual points may be off-slope by as much as 0.5 degrees. So much for all those decimal places!

You can do the same exercise with RAAN, and the other quantity which changes continuously, Mean Anomaly. Steady parameters Inclination, Eccentricity and Semi-Major Axis can simply be averaged. By plotting the graphs — or doing the equivalent manipulation by computer program you can reveal a *Smoothed Ephemeris* which has real accuracy and long term utility.

So, based on Keplerian Element sets from May 1985 to May 1986, here is a set which I promise you will find workable for that period and all of 1986. They are the elements as used by the command stations, and are flying in AO-10.

Object	OSCAR-10		SHARP PC12455/6/7 DATA
Epoch Year	1986		
Epoch Time	137.726923	days	G=3058.726923-
Inclination	26.3	deg	I=26.3
RA ot Node	79.8268	deg	O=79.8268
Eccentricity	0.6	—	E=0.6
Arg of Perigee	111.2718	deg	W=111.2718
Mean Anomaly	0.0	deg	F=360.985647-
Mean Motion	2.05855275	rev/day	N=12.9342684-
Decay Rate	0	rev/day/day	Q=-0.1611
Epoch Rev	2201	—	V=0.2696
Semi-major Axis	26105.3	km	A=4.09293

RA of Node changes at a rate of -0.1611 deg/day, and Argument of Perigee at a rate of 0.2696 deg/day.

Accuracy: the RMS (1 sigma) uncertainties are: epoch time 7 seconds; RAAN and Arg Perigee 0.08 deg; mean motion, and rates of change of RAAN/ARG Perigee 0.0003 deg/day.

de G3RUH, May 20, 1986.

JAS-1 SPACECRAFT

At the time of preparation of this column, JAS-1 was scheduled for launch on July 31, 1986 at 2030 UTC.

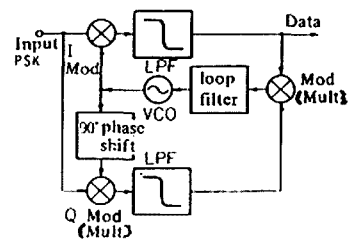
From Keith ZL2BJR/JA, we have an update on the demodulator circuit published in the June/July issues of this column. I also understand that Jim Miller G3RUH, is also preparing a suitable demodulator for this spacecraft along the lines of his now renowned OSCAR-10 PSK Demodulator.

However, from Keith, we have the latest JA offering and for those persons interested, a PCB Pattern and Board layout is included in the *JARL CQ 1986 Issue No 6 Magazine.*

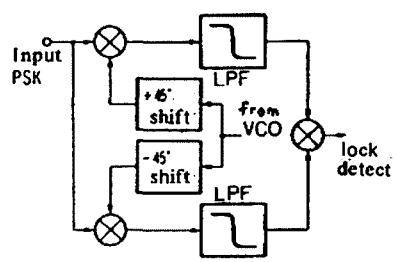
JAS-1 PSK DEMODULATOR REVAMPED

The earlier-described PSK demodulator "AF-DEMO" was developed for receiving OSCAR telemetry. The circuit was simple, but the lock range was only ±100 Hz — adequate for a satellite like OSCAR-10 which is in a high orbit, but not very satisfactory for JAS-1 (because Doppler shift is relatively large). The "AF-DEMO2" circuit described below uses a Costas loop PLL with lock range of ±200 Hz, and has "locked," input frequency low ("up") and high ("down") outputs which can be used to automatically correct the transceiver frequency ("up"/"down" outputs occur when the input frequency shifts about 100 Hz from 1600 Hz). A level meter can also be added. The VCO runs at 12.8 kHz, and is divided by eight; a shift register (74C164) gives the desired phase shifts. One adjustment is required: short JP, *so* U9 operates as a voltage follower and its output

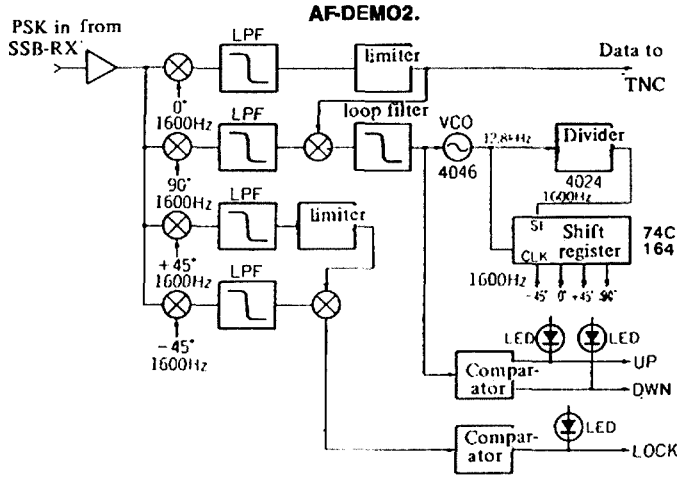
Costas Loop Demodulator.

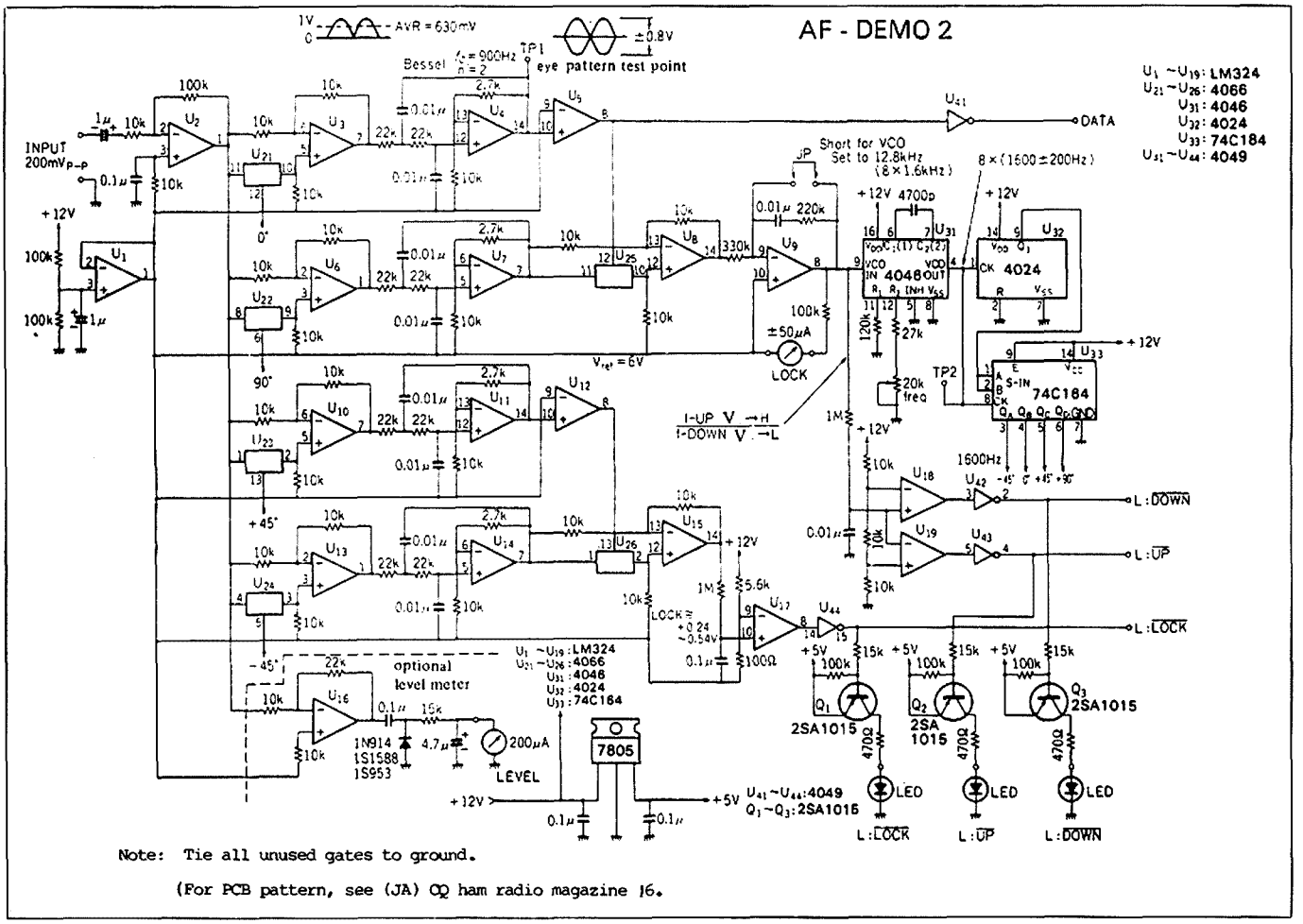


Adding "lock" Indicator.



AF-DEMO2.





Note: Tie all unused gates to ground.

(For PCB pattern, see (JA) CQ ham radio magazine 16.

equals Vref (6 V), and adjusts the 20 kohm "freq" preset so VCO output frequency is 12.8 kHz (1.6 kHz x 8).

A stable power supply is required.

TESTING THE PSK DEMODULATOR

The Manchester encoder described previously can generate a suitable PSK signal — replace the 1200 Hz clock with 1600 Hz. It is best with two TNCs, one generating a PSK signal and the other demodulating it. If only one TNC/modem is available, tape the (A)PSK signal, and use monitor mode to receive it.

de Colin VK5HI

ar

SATELLITE ACTIVITY FOR PERIOD APRIL 1 TO 23, 1986

1. LAUNCHES

The following launching announcements have been received:

1986-027A (16667)	Cosmos 1738	April 04	USSR
1986-028A (16677)	Cosmos 1739	April 09	USSR
1986-029A (16679)	Cosmos 1740	April 15	USSR
1986-030A (16681)	Cosmos 1741	April 18	USSR
1986-031A (16663)	Molniya 3-28	April 18	USSR
1986-032A (16687)	Progress 26	April 23	USSR

2. Returns

During the period, 47 objects decayed including the following satellites:

1976-065B	OPS 3986	April 24
1986-020A	Cosmos 1734	April 26
1986-023A	Progress 25	April 21
1986-029A	Cosmos 1740	April 28

3. GENERAL

Spacecraft 1986-019A SPOT-1 had the following orbit parameters:

Period 101 72 min	Inclination 98.7 degrees
Apogee 838 km	Perigee 815 km
Transmitting Frequencies	2205.900 MHz 0.1W 5745.000 MHz 8253.100 MHz 20.0W 8307.100 MHz 0.04W

Spacecraft *Viking* 1986-019B had the following orbit parameters:

Period 262.18 min	Inclination 98.8 degrees
Apogee 13544 km	Perigee 819 km

ar

QSP

SO THEY SAID . . . 25 YEARS AGO!

▽ An amateur satellite? Preposterous! But West Coast amateurs have picked up a far-out suggestion by W6TNS in a *CQ* magazine article and are gung-ho to build an *O*rbital *S*atellite *C*arrying *A*mateur *R*adio on two- metres. All we need is a piggy-back ride.

From *QST* February 1986, and contributed to AR by Steve Mahony VK5AIM

TRY THIS

CB ANTENNAE FOR 20 METRES

Lionel Curling VK3NM/ZL1SW
18 Lexington Street, Vermont, Vic. 3133

With a few easy steps, convert your obsolete CB antenna for use on 20 metres.

Should you have, or are able to obtain a half-wave 27 MHz *Station Master* CB ground plane, it can simply be modified for use on 20 metres by removing the base-loading coil and replacing it with a shorting strap.

Slight pruning of the vertical element may be necessary to suit your preference of operating frequency. Further, you may also wish to consider replacing the orange PC conduit (base insulator) to a more suitable ultra- violet radiation resistant type.

ar

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.020	JA6YBR	*Japan*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Japan*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0SJ	*Macquarie Island (Keyer)*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Port Samson (Karratha)*
52.325	VK2RHV	*Newcastle*
52.350	VK6RTU	*Kalgoorlie*[1]
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2R8Y	*Sydney*
144.430	VK3RTG	*Glen Waverley*[2]
144.465	VK6RTW	*Albany*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Port Samson (Karratha)*
144.800	VK6VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Port Samson (Karratha)*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1. From the pages of the *West Australian VHF Group Bulletin* for May 1986 comes a complete listing of all their operating beacons and included is VK6RTU, at Kalgoorlie. This was removed from the above list some time ago as no one could confirm that it was operating.

2. Gil VK3AUI, confirms the VK3RTG beacon is operating from Glen Waverley, on a high point with a good look-out in all directions.

Whilst on the subject of beacons, I have received a long letter from Peter VK3AWY, which contains quite a deal of information on the state of VK3 beacons and some of their repeaters. Of interest to readers will be the following:

"The VK3RGG beacons on 52, 144, and 432 MHz, along with repeaters VK3RGL, VK3RGC, and VK3RBU, are operated and maintained by the Geelong Amateur Radio Club.

"The six metre beacon was operational until three years ago when internal problems at the site (Mount Anakie) forced us to temporarily suspend operation; so the opportunity was taken to re-build the beacon. Lack of room at the site finally saw the beacons close down.

"The Club, in conjunction with the WIA, decided to pursue acquisition of a site at Mount Anakie. After two-and-a-half years of problems with state and local government and bureaucracy in general, a planning permit has now been issued by the local council. Plans for a building are in the hands of the Institute's draughtsman and it is hoped to have the necessary building permit within eight weeks, after which time construction will commence in earnest with a projected completion date of November 1986.

"Installation of repeaters VK3RGL (2 m), VK3RBU (70 cm), and beacons VK3RGG (6 and 2 m), should take place within two weeks of the completion of the building.

"The new building has been designed to accommodate four 19 inch by seven feet (482 mm x 2 m) equipment racks, work-bench, isolated battery box and room to move. Present equipment will occupy two racks with the remainder designed for future expansion. The 70 cm beacon is part of this planned expansion and could be operational during the latter half of 1987.

"All beacons and repeaters installed at Mount Anakie will be controlled remotely via a two metre uplink. The system currently in operation on VK3RGL is based on the *INTEL 8748* single chip micro-processor.

"The Club also constructed and installed VK3RGC (147.725/147.125) at Montpellier (on the western edge of Geelong) during 1985. This is a low power local area repeater designed to serve Geelong and the surrounding areas to about 20 km."

Thank you for the fill in information Peter. The Club certainly has not been wasting its time during the period the beacons have been missing and we look forward to the completion of all the projects.

Still on beacons and associated information. Gil VK3AUI, reports that Lionel VK3NM, recently had a contact with Sojo VK0SJ, at Macquarie Island, on 20 metres during which it became known that Sojo is set-up on six metres and has a keyer running on 52.150 MHz (added to the above list). Sojo has heard the Hobart six metre beacon at odd times. Sojo is very keen and spends quite a lot of time on 40 and 20 metres and would welcome reports.

Gil says to contact Sojo is fairly hard but probably the best way is by Telex, which goes in by satellite. This is called *Inmorsat* and the Telex number is 582 1543115. Due to the cost, a short message would be best providing sufficient information is included for Sojo to understand what is required of him.

Two metres is not yet operational from Macquarie, but Sojo will have it ready at the first opportunity, hopefully when weather conditions improve later.

Sojo runs the keyer on 52.150 and monitors other beacons and the call frequency from time to time.

While talking about the beacons from cold places, Mark VK5AVO ex-VK0AQ, said the Mawson Beacon is not likely to be on during the winter months as the building in which it is housed gets very cold and frequency drop out can occur and this is not helped when power failures occur at Mawson. There are hopes that the beacon will return to a normal schedule from about November onwards. Apparently the hut which houses the beacon is not well located and it is quite a task walking through the snow to re-activate the beacon during the winter, hence it is easier to leave it off.

BRISBANE REPORT

A very interesting letter comes from Paul VK4AUR, who lives at Wynnum in Brisbane and for the first time really gives an Insight into the extent of the end of year/early 1986 openings on two metres in that area, and further reinforces the solid coverage of the various two metre openings at that time.

The first opening occurred on December 5, 1985 from 0744 to 0752, when VK4AUR worked ZL3ADH, ZL3ADT, ZL3DJ, and ZL3TIC. All signals were around S3. At 0816, heard ZL2TAL briefly.

The next opening was on 27/12 with ZLs, VK1, 2, 3, 5, and 7 being worked. The next morning at 2233 UTC (still 27/12 day) until 0140 (28/12) Paul worked VK3DFI, VK5NC, VK7ZIF, VK7ZAR/7, VK7ZJG, VK3XEX, VK5DJ, VK5AIM, VK5ZRO (mobile), VK5ZDR. Signals varied from S3 to S9+.

On January 1, 1986 VK4ZSH worked VK8ZLX at 0820. At 0832, the band opened again and VK4AUR worked VK3WN, VK5NC, VK3DFI, VK3DRF, VK3AUU, VK5DK, VK3BEH, VK3XEX, VK3BDL, VK3XQ, VK3ZYN, VK3AUI, VK3DUQ, VK3DU, VK3AGB, VK3KQQ, VK3KUB, VK3AVJ, VK3ZBJ, VK3KAS, VK3UM, VK3AMZ, and VK3BHS. Signals were often S9 with the signal from VK3UM at S9 +20 dB for 10 minutes!

On 8/1, at 0823 worked ZL1SW (actually Lionel VK3NM, on holidays!) with S5/7 signals for ten minutes. On 10/1 worked VK7s ZIF, ZAR, and JG, between 0946 and 0956, at S5.

The last real opening was on 15/1 between 0656 and 0911 when VK7ZIF, VK7KJ, VK7CU, VK7ZAR/portable, VK7DC, VK3ZEO and VK5AKJ were worked with signals to S9. VK7ZAR portable was incredibly strong at 0709 UTC, and from then on "all hell broke loose!" Another 30 stations in VK3, VK5 and VK7 were worked, signals peaking to S9+.

Since then, Paul reports, the band has been relatively quiet! If it wasn't for Gordon VK2ZAB, and his scheds on 144.300 each Saturday and Sunday morning, the SSB part of two metres would be very quiet. The ZL2VHT beacon has been heard along the Gold Coast and north of Brisbane on a few occasions (3/2, 4/4, and 6/4) but no ZLs.

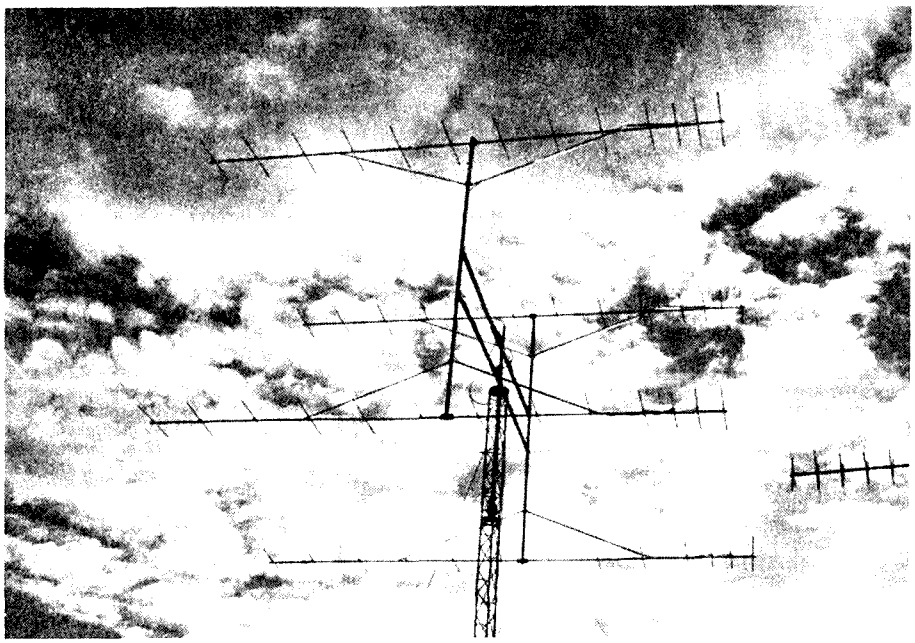
On 4/4, in addition, the ZL 70 cm beacon was also in at good strength, but no ZLs!

The equipment Paul VK4AUR, uses consists of a TS-711A transceiver, HL-160V25 amplifier at 180 watts PEP, a VV-200VOX mast-mounted GaAsFET pre-amplifier. The feedline is 9913 coax feeding in a four port power divider and 9913 coax phasing harnesses. Antennas are four, 13 element long boom Yagis with ERP possibly around 18 kW. However, during the Es openings he was using a home-brew 15 element quad, so he was down quite a bit on ERP. The present QTH is at sea-level and the antennas are at 50 and 40 feet (about 15 and 12 metres). Paul also mentioned some activity associated with the Eta-Aquarids meteor showers on May 4, 1986. He worked David VK3AUU, at 2210 on the Sunday morning with S7 reports both ways. After a quick contact with VK3UM, VK1BG and others on 80 metres, he set up a beacon on 144.300 with periods of 10 seconds transmit and then 10 seconds receive, running time 2300 to 0200 Sunday morning and again from 0800 to 1200 during the evening. No one was actually worked but a few signals were copied, mostly during very short bursts. The best was two seconds of CW at S2/3 at 0902 UTC. Later John VK2FG, in Glenbrook reported hearing Paul's keyer at different times amongst the 33 signals heard during the evening session. Other reports said VK4AUR was also heard in VK1 and VK3. He concluded it was an interesting experiment.

I was not aware that Paul had come from New Zealand originally. But after early July he was to return to New Zealand permanently and will be putting out a good signal from ZL1. He suggests VK stations look for him on 144.100 SSB. Thanks for writing Paul, we all wish you well in New Zealand and would certainly appreciate hearing from you as time permits.

A VERY LONG ANTENNA

The May 1986 Japanese *CQ ham radio* 50 MHz page carries some details of what must surely be the ultimate antenna for 50 MHz. It has 11 elements on a boom 13.4 metres long (that is more than 40 feet). It is capable of operating at 1000 watts PEP, has a gain of 14-16 dB, front-to-back ratio is 22-26 dB, side-lobes 25-30 dB, the SWR is 1.25:1 at 50 MHz, 1.1 at 50.750, and 1.3 at 51.500, 1.5 at 52.000 and 1.8 at 53.000 MHz. And it



The four by 13 element two-metre array of Paul VK4AUR, In Brisbane.

weighs 20 kg. Quite a structure. Imagine four of those on six metres, they would make the band hum a bit! Thanks to Graham VK6RO for the information.

While on the subject of antennas, I note that David VK2BA has been making the most of the winter six metre lull by replacing the elements on his beam to allow it to operate on 50.110 MHz. His 10 metre beam of five elements has also been returned to the mast in anticipation of some solar activity.

THE ROSS HULL MEMORIAL CONTEST

Following my request, some comments have come in regarding rules and scores for the annual Ross Hull Memorial Contest conducted in December/January. The following points seem to convey the general impressions gained:

1. The length of the contest was about right.
2. The scoring points on the basis of being irrespective of distance seemed completely unacceptable.
3. The points for bands above 1296 MHz were far too high when compared with the one point for 52 and 144 MHz.
4. The bonus for each new call area made operators chase call areas rather than working more readily available stations in already worked call areas.
5. With the already high points for bands above 576 MHz there was no need for an extra bonus of 10 points for each extra band used.
6. The number of logs submitted is in no way a reflection of the total number of participants. A count of the stations worked by the higher scoring entries should give an indication of the interest in VHF/UHF at that time of the year.
7. Human nature dictates that if you have little chance of receiving an award then you are less likely to submit an entry in the contest unless your entry can be counted along with others to form a State or some other total. Some said they rarely ever sent in logs but were never-the-less very interested in the actual contest and thought VHF would be the poorer for not holding the contest in the summer.
8. A bonus could be considered reasonable if it was applied after working a certain number of stations; eg perhaps an extra five or 10 points for every completed 10 contacts and would possibly be best applied on a band by band basis rather than a totals basis. This could lead to more contacts on each band.
9. There was support for the idea of the contest being tor operation on 52, 144 and 432/576 MHz for a combined total, with separate awards for top scorers on the bands 1296 MHz and above.

From the above you can see some thought is being given to the present problems. As your writer of these notes, I state here and now that I am totally opposed to the abolition of the Ross Hull Memorial Contest and will do everything I can to keep it going. The cause would be helped if more logs were submitted, but I did in fact work hundreds of stations in the summer Es period so there are plenty of stations active at that time.

50-54 MHz DX STANDINGS

DXCC Countries based on information received up to June 15, 1986. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given for contacts made with stations when 50 MHz was not authorised.

Column 1: Six metre two way confirmed
Column 2: Six metre two-way worked
Column 3: Cross-band (6 to 10) confirmed
Column 4: Cross-band (6 to 10) worked
Column 5: Countries heard on 50 MHz
Column 6: Countries heard on 52 MHz

CALL SIGN	1	2	3	4	5	6
VK8GB	42	42			13	
VK2BA	29	29				
VK4ZJB	28	28				4
VK2DDG	25	26		2	12	3
VK3OT	25	25			10	
VK2QF	25	25				
VK2VC	24	24				
VK3AWY	22	22				
VK2BNN	20	21				
VK5LP	20	20			6	3
VK3XQ	19	20			1	1
VK4ALM	19	19				
VK3AMK	17	17				
VK4TL	17	17				
VK3NM	16	17				
VK7JG	16	17			2	
VK3AUI	16	17				
VK4ZSH	15	16				
VK4ZAL	14	14				
VK6OX	10	10	1	1		
VK3ZZX	10	10				
VK6RO	9	9	3	3	2	3
VK4KHZ	8	10				

The minimum number of countries confirmed for an operator to commence being listed is five, including VK.

The position on the list is determined by the number of confirmed contacts. Where two or more operators have the same total, those first date listed with that total can only be displaced by someone having a greater number ot confirmed contacts.

The next list will appear in February 1987, and entries will need to be on my desk no later than December 15, 1986. Claimants are reminded that full details of all contacts are required; vis date of contact, time in UTC, call sign of station worked, country, mode, report sent and received, QSL sent and whether received, split frequency contacts should be indicated. Please add your own call sign and date of your claim.

I still reserve the right to ask any claimant for QSL cards to support verification if considered necessary.

Further entries are invited. The fact that you may not have worked as many countries as someone else should not stop you from entering. Someone has to be at the top and positions on the ladder do change from time to time. This time we see John VK4ZJB, moving into third place, he was formerly in position five, while Graham VK8GB, further consolidated his top position by adding two more countries with one more confirmation still to go to bring his confirmations to 42 countries.

Incidentally, it is interesting to note the call signs of the countries heard by Graham on six metres but which he was unable to contact. They were WA4TNV/KL7 on March 28, 1981; ZS6LN on April 16, 1979; KZ5NW on March 11, 1979; KP4CL on April 3, 1980; ZK1AA on April 25, 1979; HS1YL on May 2, 1980; HI8DIA on February 20, 1982; PJ9EE on March 23, 1982; EL2AV on April 4, 1982 and TI2NA on April 6, 1982. In addition, the following beacons were heard: ZB2VHF 18/11/81; FY7THF 3/80 (on many occasions); 5B4CY 3/4/80. No stations were worked cross-band 10 metres to six metres.

BEACONS OF THE WORLD

Bill Tynan W3XO, in his *QST* columns *The World Above 50 MHz* for June 1986, carries a list of known beacons of the world. His list gives 82 beacons between 50.005 and 52.510 MHz. Of these, 56 are below 50.100, with a further 20 in our own area and New Zealand on 51 and 52 MHz. I feel tempted to give you a one-off coverage of this listing for future reference, but will defer the matter for the time being. I note there are no less than eight beacons listed for South Africa.

GENERAL NEWS

During May, I had the opportunity of meeting Gordon VK2ZAB, at his home during one of my travels. His superbly situated VHF site brings out the pangs of envy, situated as he is on the top of a hill at Berowa Heights, with an unobstructed 360 degrees view of the country-side. Just for an exercise, Gordon suggested it may be possible to speak to someone in Canberra, so he fired up on 70 cm and immediately has an S9 contact! Signals were even there from Melbourne and the night was not considered to have been enhanced in any way for propagation. Gordon is regularly in contact with stations over a large area of New South Wales and works into Brisbane as well.

The important point, of course, is the fact that Gordon does in fact have a very good site, but he ***is*** using it to advantage and by so using it is encouraging others to come on and have contacts. One can now also understand why he has been so successful with contacts using aircraft enhancement with his 0 degrees horizon.

In an effort to increase interest in contacts via aircraft enhancement, Gordon sets out the following parameters which, if available, could lead to success using this mode:

1. S2 peak signal considered the minimum; ie -135 dBm;
2. transmitter power 400 watts PEP;
3. antenna gains 20 dBi at both ends;
4. 747 aircraft at 40 000 feet;
5. angle of incidence one degree minimum;
6. receiver limited by external noise only; ie a reasonable noise figure.

All this gives an optimum distance of about 1020 km.

Gordon points out that distance is not far short of the Adelaide to Sydney path and suggests anyone east of Adelaide, with a view not obstructed greater than one degree (or less is even better) should be able to make it to Sydney

with the now fairly frequent 747 flights. The flight has to be such that the aircraft track crosses the signal path; ie Adelaide to Sydney flights are worth trying, but Adelaide to Melbourne are not.

Gordon would be prepared to attempt contacts with anyone dedicated enough to try, but any reduction from the parameters listed drops the signal level accordingly; eg 100 watts PEP is 6 dB down so signals would be S1. The distance also applies regardless of frequency; ie the same conditions apply on 70 cm as on two metres.

So there you are, the challenge is offered. I would like to try but my three degree horizon to the east makes it virtually impossible, but I am sure someone like Roger VK5NY, sitting on his mountain top would have a good chance. Over to readers!

MOUNT GAMBIER CONVENTION

A very successful SERG June Holiday Convention was held at Mount Gambier with attendances up on last year. The weather was generally quite good for the time of the year and a very extensive events program was conducted. The SERG Trophy was won by Victoria as it was also last year, so VK5 is going to have to get the big stick out if they want to regain the coveted trophy.

The number of entries in the home-brew competition was down on previous years and in judging the entries, I formed the opinion that the work was not as tidy as usual. The winning entry was a beautifully made, two metre cavity filter which was constructed of copper and brass and was one of 26 such devices made by the entrant, Brian VK3AFN.

CLOSURE

As I was closing off these notes the mail arrived and included a letter from Graham Baker ex-VK8GB, now residing in Canberra. Graham confirmed his contact with ZM8OY, which now completes his list of 42 confirmed countries from Darwin. Congratulations! Accordingly, the Standings List has been amended but the text regarding Graham, which was previously written, has been left as written.

Graham says he has bought a house and is gradually settling in, but so far is not operational on amateur radio.

Although we are at present in the lowest part of the sunspot cycle, I would suggest you still keep an ear on six metres during the coming equinoctial period, when occasional improved conditions result in long distance contacts particularly out across the Pacific. Of course, November/December/January later this year will be a prime time to also be looking in that direction on both six and two metres!

Closing with the thought for the month: "The hand that lifts the glass that cheers, should not be used to change the gears!" and "A man's reach must always exceed his grasp!" 73 — The Voice in the Hills.

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How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

Winter is nearly behind us and spring is in the offing, when one will be able to enjoy the sunshine. Now is the time to plan a check of your antennas before the spring and summer winds are upon us, also to see how the weather-proofing stood up to the winter rains, sleet, frost and at times around this QTH, the birds.

The solar cycle should start to begin a climb to allow better DX later this year or early next year, although really the low has not been so bad. One has had to search just a little harder for those wanted countries.

I have not made a plea for reports and assistance with the column for a considerable time. However, I would like to see some more reports in the mail each month of what you, the reader, has been hearing or working, so that it may be passed on to your fellow DXers, not only in Australia, but world-wide as these notes are distributed to a number of overseas newsletters and magazines on a reciprocal basis.

So how about it ladies and gentlemen — some more information please for the column you read!

CONGRATULATIONS

The President of JARL, Shozo Hara JA1AN, was decorated by the Japanese Government in April. The citation, in part read 'In recognition of your contribution to the development of amateur radio as president of the JARL for 16 years.'

Part of the criteria for the award is that the recipient must have served an organisation for 15 years and be older than 58 years of age. JA1AN is 59.

On behalf of all DXers, congratulations and thanks for all you have done for amateur radio, Shozo.

BAROMETRIC CHANGE

As from May 1, 1986 the Australian Bureau of Meteorology has replaced the readings of barometric pressure from millibars to hectopascals (hPa) to include greater international standardisation of equipment.

The numerical value of each unit is the same — one hectopascal = one millibar and barometers can be read as before by just changing the wording.

Incidentally, this is not the first change as up to 1919, the barometric change was quoted in millimetres due to the pressure change in a tube of mercury.

The change has been given very little publicity, but someone with a sense of humour placed the following advertisement in a West Australian newspaper:

Approach. Marriage
BARR-PASCAL: Mr and Mrs Barr are pleased to announce that on May 1, their daughter Millie will become Mrs Hector Pascal.
Congratulations Millie.

DODECANESE ISLANDS

Due to a licence examination now being able to be taken on the islands, it appears that there could be an increase in activity from this area in the foreseeable future. Apparently 13 new licenses are about to be issued.

BELIZE

From July 1, V3 call signs were effective as follows:

The prefix V31 will indicate a Grade 1 licence and V32 Grade 2 certification. The suffix blocks in geographical order are AA-BZ = Corozal, CA-DZ = Orange Walk, FA-KZ = Belize, LA-MZ = Stan Creek, NZ-QZ = Cayo and PZ-QZ = Toledo.

THE RIGHT APPROACH?

9Q5JW, is noting on the back of his cards — "I am sorry but I have not yet the regular authorisation for transmission because of problems with local administrations delay. This is only to confirm and is not valid for DXCC, WAZ or others." At least everyone knows where they stand and the card is valueless unless authorisation, if granted, is back-dated.

ANOTHER PREFIX AND SUFFIX

AZ#ARU is in commemoration of the IARU Region 2 Conference to be held in Buenos Aires from October 20 to 25. The prefix and suffix will be heard until October 31.

WAC UPDATE

The International Amateur Radio Union (IARU), has updated and improved the Worked All Continents Awards program. Two new certificates have been created, one for CW and one for Phone.

The IARU has officially adopted the boundaries of the six recognised continental subdivisions of the world. It is of interest that they issued 137 5-Band Certificates last year, 20 6-Band, 3 QRP and 79 Satellite Certificates amongst numerous other types that were issued.

INTERNATIONAL REPLY COUPONS

International Reply Coupons (IRCs) are now 75 cents each from Australian post offices. They have climbed to 80 cents each in America and there could be another rise in VK shortly.

FRANZ JOSEF LAND

Contrary to a lot of discussion on the 20-metre band, the station EK1P, was operational from Franz Josef Land. QSL via PO Box 88, Moscow.

SINAI DESERT

Beware! 'SU2B' has been active and giving his QTH as the Sinai Desert. He is asking for QSLs to go to Johan, NAPO 30, 3509 VP, Utrecht, Netherlands.

BULLET PROOF VEST AT LEAST

VQ9ZZ has left Diego Garcia and is now on a tour of duty in the Philippines. It is his intention to try to activate Spratly Island next March.

My opinion is that this area should be temporarily deleted from all DXCC listings before another unforgettable experience, that will be more disastrous than the last, occurs or at least until hostilities in this area cease.

I personally feel that he is a very courageous man but also very foolhardy to risk his life, as well as others, to give DXers a new country for their DXCC tally.

NIGER

Alan ex-TU2GC/TU4BR, and his wife Mary ex-TU2GD/TU4BS, have gone QRT. They commenced a two year assignment in 5U7-land last month and are hoping that the authorities will grant them a licence. So do many DXers!

MAURITIUS

According to a number of reports, licensing in this area is becoming rather difficult for the locals as well as visitors. If this is the trend, it is going to be more difficult to get operations off the ground from 3B6, 7 and 9 and they will gradually climb to being in the much wanted zone of countries for DXCC.

AGGRAVATION

The stories of the aggravation between Frank DL7FT, and the Greek amateurs over the Mount Athos operation seem to be appearing everywhere, as well as being heatedly discussed on various bands.

Unfortunately there is enough aggravation in the world today without it creeping into the hobby we all enjoy.

Probably the whole truth will never be known but if the documentation is accepted by the ARRL, good. If it isn't, let it be written down as experience. Similar occurrences have happened before so let's forget it! Let us get on with DXing and making international friends, in this the International Year of Peace.

MOZAMBIQUE

The Mozambique International Amateur Radio Association has been formed recently. Unfortunately it doesn't look hopeful for any activity for a long time though.

A station signing C9UFM, has been heard but it is a 99 percent chance that his paper-work, if any, would not stand up to scrutiny.

However, all may not be lost from this area, as the Mozambique licensing authorities are believed to be inquiring into purchasing monitoring equipment that will cover the amateur bands. Maybe there could be a scent of activity on the horizon, even though it may be very distant.

MARION ISLAND

This island will not be heard this year as the working party has departed with no amateurs in the crew.

Next year is another hope, as service of one

year on the island counts the same as their compulsory National Service.

I think I know which alternative I would be taking if placed in a similar predicament — learning to become an amateur, passing the exam and putting my name down fast.

4U1VIC AND THE HEAT IS ON

The controversy over whether 4U1VIC, should have separate country status for the ARRL DXCC Award is unfortunately heating up. Reprinted below is the April editorial from *QSP*, the monthly journal of the *Osterreichischer Versuchssenderverband (OVSV).*

"You will remember that we (the Austrians) have already announced several times in *QSP* that 4U1VIC could become recognised for the status of a separate DXCC country. Logically, as the Vienna International Centre is an extra-territorial area and is recognised as the third centre of the United Nations, the analogy with 4U1UN and 4U1ITU is clear — or is it? At least to a European's modest thinking, it would seem so.

"It is as inexplicable for the Austrian 'relatives' of 4U1VIC as for the entire European DX community in general that the ARRL (or the Internal DXCC organisation) has managed so far considerable efforts in preventing country status for 4U1VIC. As this appeared to not be enough to block the status, the DXCC rules were then changed to apparently exclude 4U1VIC.

"We feel that this is a special insult in that ZC4 was recognised as a country 'under conditions not unlike that of the United Nations. We do not really know what is behind this action. It is certain that some American amateurs have voiced their opinion to the ARRL, but unfortunately without success.

"In his justified rage over this matter, the first President of the Vienna International Radio Club, (Dr Horst Eisenlohr OE3OLW ex DL9OL), in a personal protest to the ARRL actions, has returned his DXCC No. 5972. It is not surprising that this scientist, with almost 25 years in the service of the United Nations, is beginning to doubt if the previously so exemplary ARRL is still what it once was.

"We can, as the OVSV, only give our amateur friends at 4U1VIC, our moral support. It is hoped that someone at the ARRL will begin to understand that the ARRL is digging its own grave, in that it is destroying its own international reputation, as well as that of the DXCC.

"Apparently a deserted island of rocks with often a doubtful country relationship has more worth than a internationally recognised major location of the United Nations. Maybe an American DXpedition to 4U1VIC, sponsored by a well-known DX Association, could bring more public exposure?

"Please help to promote democratic conditions in this matter: in QSO with Americans, ask them when the ARRL will finally grant DXCC status to 4U1VIC.

"Signed: Dr Ron Eisenwagner OE3REB,
"President, Osterreichischer
Versuchssenderverband (OVSV)'

My personal comment is that I don't feel I am qualified even with all the facts at hand, to make judgment of who is right or wrong but I do have one question, why was Rule 5, which encompasses this problem, changed after 4U1VIC's application was purportedly submitted for consideration? What is fair to one is fair to all and as I have previously noted in this column, either allow 4U1VIC in or delete all the others that do not meet the criteria as the wording now stands.

ANTIPODES

Tony KL7AF, a member of the WIA, had the pleasure of a visit from Graham VK0GC. Graham is presently touring America in a Camper Van.

Tony's QTH is Kodiak Island, which is very close to being the antipodes of Macquarie Island, where Graham was located. It is thought that they did have a QSO during Graham's stint on the Island, but it is not known for sure.

A LITTLE HUMOUR

Ever been in a big pile up or a net operation for a rare station? The stations before you are giving the much wanted station their families life history. Well a poem written by W4UP, for *CQ* magazine sums it all up in saying:

Surely there's a special place in hell,
Full of chains and whips of heavy leather,
For those in a pile-up, contest style,
Must send name, address and current weather.

Operators, one and all, remember this the next time you get to work that much wanted station please — because I might be next in line!

SENEGAL

The following Senegalese prefixes represent the 'counties' as follows:
6W1 — Cape Vert, 6W2 — Casamance, 6W3 — Diourbel, 6W4 — Fleuve, 6W5 — Senegal Oriental, 6W6 — Sine-Saloum, 6W7 — Thies and 6W8 is Loga.

A PUZZLE OR CONFUSION?

Bob Winn W5KNE, Editor of *QRZ DX* poses the following . . . "Here is an interesting puzzle, the Golan Heights, a 400 square mile plateau, which was originally a part of Syria, was captured by Israel in 1967, and annexed by Israel in 1973, it is patrolled by United Nations peace-keepers, but for DXCC purposes it counts as Syria." Personal comment is why? . . . VK3AH.

SOVIET UNION

Soviet Union amateur prefixes can be a mystery. Following is a list of prefixes and to what area they denote.

RA, RN, RV, RW, RZ	Russian SFSR.
UA, UN, UV, UW, UZ	Russian SFSR.
RB, RT, RY, UB, UT, UY	Ukrainian SSR.
RC, UC	Byelo Russian SSR.
RD, UD	Azerbaijan SSR.
RF, UF	Georgian SSR.
RG, UG	Armenian SSR.
RH, UH	Turkmen SSR.
RI, UI	Uzbek SSR.
RJ, UJ	Tadzhik SSR.
RL, UL	Kazakh SSR.
RM, UM	Kirghiz SSR.
RO, UO	Moldavian SSR.
RP, UP	Lithuanian SSR.
RQ, UQ	Latvian SSR.
RR, UR	Estonian SSR.

A FAMILY PROFILE

It is not uncommon these days to find family groups with a common interest in Amateur Radio. One of the wonderful concepts of our hobby is the way it caters for such a wide variety of interests within the overall context. This family finds the radio to be an excellent means of keeping in touch with other — sunspots and band conditions permitting.

It all started in 1950, when John, encouraged by Brian VK5CA, gained his AOCP and became VK5WY. John at present is the Senior Mining Engineer for Bouganville Copper Limited in Panguna, Papua New Guinea and he finds time for other varied interests such as photography, sailing, silversmithing and is a keen 'home brewer', an interest he shares with his son Peter.

Philip, (Sue's husband and John's son-in-law), is an electrical engineer with the State Electricity Commission in Victoria, at the Hazelwood Power Station located in the Latrobe Valley. They live on a small farm overlooking the valley, where they breed sheep. Philip's other interests include photography and apiculture and Philip finds time to be an active member of the volunteer Country Fire Authority.

Sue is a librarian, teaches Indonesian studies and craft and has other interests such as reading, needlework and gardening. Both Sue and Philip enjoy bushwalking and cross country skiing when time permits.

Peter's life is electronics, and he is a keen constructor who enjoys discussing his projects whilst talking to his father in Panguna and is studying Electronics Engineering in Melbourne.

John is still hopeful that his youngest daughter Cathy, will take up the hobby. Cathy has passed the CW, but has temporarily 'relaxed' on her theory studies due the pressure of examinations of her final year at High school.

John's wife Noreen and the other members of the family tolerate the hobby patiently, John admits, but they have many varied interests in the art and craft field, showing very little inclination to the pastime we all enjoy.

BITS AND PIECES

Phil VS6CT, hopes to be operational for a short stint from KP2 this month. * * 9U5JB, Jim "Bull" Bullington, went ORT on July 7. Where will he become Ambassador next? * * RF0FWW, runs a net on Wednesday and Friday of each week on 14.195 MHz. * * Visiting Japan late this month — then don't miss the 'Amateur Fair' and the Tokyo DX Convention in Tokyo on the 22, 23 and 24th, which will be held at Harumi. * * Market Reef could have a prefix different to OJ0, for future DX operations. * * Some JA operators are keen to operate ZA with the assistance of BY operators this year. A possibility? * * Manola 3C1MB, is still quite active from Equatorial Guinea. If you are

From L to R: Philip VK3KAC, Peter VK3DXD/P29PW, Susan VK3PSO and John VK3CWY/P29JW.

lucky with a contact, QSL to EA7KF You will receive a quick turn around. * * 25 candidates sat for the VU examinations on April 25. * * 6F2 and XE86, were special prefixes for the Mexico Soccer World Cup Games. XE86NJ operating from the games site is XE1NJ. QSL to K6VNX for 6F2MX, XE2AQ for 6F2AQ and XE2FL for 6F2FL. * * N7DF/TT8 cards are now acceptable for DXCC whilst DL7AH/3X November 1984 CQ WW CW cards are a no-no. * * Bhutan and Japan signed a diplomatic agreement earlier this year. Can we expect to hear Pradhan A51PN, to have company and assistance in the near future? * * ZS25 is a prefix all ZS club stations were allowed to use until the end of May. * * XX9WS is operated by JA1WSA/JJ3PRT QSL to JH1AGU. * * TF1 is an unusual prefix. There is only one listed in the Call Book. Watch for TF1PS below 14.200 MHz around 1200 UTC. * * Don't forget SEA Net each day of the year at 1200 UTC on 14.320 MHz. * * Another unusual call heard around has been 4U0ITU. It is a special call for 4U1ITU — reason unknown. * * GB0SWR should be in 5W this month. * * Rag JW7FD, active from his 'second' home, Bear Island * * 'XV1AA', very doubtful if he was genuine. * * JA1ACM, is reported to have sent 5X5GK, a complete RTTY station. * * JW0A quite active. * * Listen on the repeaters for Ross WB6GFJ, who will be visiting VK2, 3 and 4 this month after actuating his ZK1XE call for the first four days of this month. After leaving VK, Ross, will actuate 3D2 and KH6, en route to his home QTH. * * Rick NJ7D ex-AL7O, started a one year tour of duty in Minami Torishima in June. QSL via NG7X. * * Mike 6W1NX ex-TR8OIT, is due to be QRV * * To receive a card for 4N0IARU, QSL to YU4FRS. * * The prefixes of XL7 and VC7 were originating from Canada. * * TV6KAR, was active to commemorate the 100th anniversary of France's gift to the USA — the Statue of Liberty. * * New radio laws purportedly came into force in Thailand on the 27th of last month, incidentally the date of their elections! Whether we will see any more activity from this area is the big question? * * Well-known DXer Mike ex-A71AD, is now signing 5B4TI. * * UA0FO is located on Sakhalin Island. * * Australia has forwarded a proposal to India with reference to a Third Party Traffic Agreement. * * A five year old Kindergarten student became Japan's youngest licenced amateur at the examinations held in April.(See page 46, July AR) * * H44JA, is QRV on 40 and 15 metres SSB. QSL to the home call JR6CMB or via JR6CMA. * * 8J3JST, was a special call to commemorate Japan Standard time. UTC plus nine hours. QSLs to JARL. * * Germany and Japan, signed a reciprocal licence agreement effective May 1, this year. * * The FO0 prefix was due to change last month to FO4 or FO5. * * ZL8OY is now QRT — QSL to ZL4OY. * * There has been a postal dispute in Finland that has and could still be holding up mail in both directions. * * NH6FU/KH9, quite active from Wake Island. * * A number of French operators hoped to actuate TP2CE, the *Council of Europe* located in Strasbourg. This initial operation was scheduled for June 27-29. They hope to attain DXCC status for the operation! (I wish them luck, but no comment — VK3AH).

IN CONCLUSION

Another 'gem' of a quote from Lee KH6BZF who produces the weekly ionospheric report *KH6BZF Reports* from Hawaii. Lee says "... I am convinced that the only people making money these days ... are the ones who sell computer paper!!! Remember: I never, ever make mistakes!!!" Lee, anyone with a computer printer would have to agree.

QSL TO —

4M4A	Mike Manafo, Colegio Internacional de Carabobo, Apartado 103, Valencia, Venezuela.
5N6MGM	Gywn Morgan, PMB 2199, Jos, Plateau State, Nigeria.
5W1FS	WB5FZL, 4132 Birch Circuit, Temple, TX 76501, USA.
9U5TN	CFE, PO Box 24077, Usumbura, Burundi.
BY5QA	PO Box 507, Fuzhou, Peoples Democratic Republic of China.
FK0AV	PO Box 672, Noumea, New Caledonia.
HC8NDH	Herbert, San Cristobel, Galapagos Islands.
HH2V	PO Box 428, Port au Prince, Haiti.
HH2LX	PO Box 1213, Port au Prince, Haiti.
HK0AZW	PO Box 120, San Andres Island, Colombia.
HK1FYH	PO Box 144, Barranquilla, Colombia.
IY7WYF	PO Box 4, Brindisi, Italy.
NH6FU/KH9	PO Box 86, Wake Island via Hawaii, 96898 USA.
OA8P	270 Skycrest Drive, Ashland, OR 97520, USA.
OD5FE	PO Box 55173, Beirut, Lebanon.
T32AN	PO Box 17788, Honolulu, Hawaii, 96817, USA.
TJ1CH	PO Box 1169, Yaounde, Cameroon.
ZK1AL	PO Box 90, Rarotonga, Cook Island, South Pacific.
ZK1CT	Dr Archie Guinea, Mauke Island, Cook Islands, South Pacific.

HEARD AND WORKED ON THE EAST COAST

20 METRES
3A2LF, 3B8FS, 3C1MB, 3C1NX, 3D2ER, 4Z4IK, 6W2EX, 9J2B, 9M2HB, AH2BE, BV2FA, BY4AA, EU1R, FR4CY, HG4SEA/MM, HL9CW, IT9ZGY*, YJW5E, KL7AF, KL7XD, NH6FU/KH9, OH3GZ/OH0, SU1ER, T30AC, T32AN, T77C, T77J, TA1E, V85AA, VK9ND, VK9ZG, XL7AGC, ZL7AA, ZL8OY and ZS5VF
40 METRES
HG4SEA/MM, HK1FYH* and YV2BXT.
80 METRES
HG4SEA/MM*, NL7G* and VE7SK.
** Denotes CW operation.*

THANKS

Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-QSO, DX FAMILY FOUNDATION NEWSLETTER, INSIDE DX, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, NIAR (National Institute of Amateur Radio - Hyderabad), PAPAKURA RADIO CLUB BULLETIN, QRZ DX, RSGB DX NEWS, WEATHER NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, cqDX, DX POST, JA CQ, JARL NEWS, KARL NEWS, QST, POLICE LIFE, RADCOM, VERON and WORLD RADIO.

Members who have contributed include VKs 2PS, EBX, 3YJ, YL, CGG and WB6GFJ.

Overseas amateurs include JH1KRC, ZLs 1AMM and AMN. Thanks to one and all who have made the column possible this month.

ar

MEMBERSHIP

Gilbert Griffith VK3CGG
7 Church Street, Bright, Vic. 3741

I hope all members have been giving serious consideration to the Discussion Paper, which was in February's AR. There has certainly been plenty of comments about one thing or another over the years, generally seen in letters to the editor.

I wonder now many WIA Divisional Councils receive notes from clubs and individuals telling them what to do.

There is really no *them* and *us*. The WIA Executive is *US*. We have to tell them what we want so that they represent us when dealing with the *rule makers*. What you, the members, decide will affect the hobby for years to come, so make sure you understand all the arguments before giving your vote.

I am still undecided and keep dwelling on the idea that it would be fine to encourage the use of computers and their various modes by amateurs, but it is a very different thing to make available parts of the spectrum for computer operation. As an amateur radio society maybe we should put the radio part first, by keeping the standards reasonably high.

Perhaps the computer hobbyist group is not the same gold-mine that the CB groups were to amateur radio and we should stop finding excuses for our laziness in recruiting new blood.

My suggestion, this month, is for every WIA member to make himself a goal to recruit a new member each year. And if everyone enrolled an already licenced amateur we would have 100 percent representation!

Probably the best way to recruit your member is to talk with him/her and find out what they want from amateur radio. Provided you know what the WIA has to offer, you can highlight the advantages.

The main advantage is, of course, representation — there is a benefit in numbers when negotiating with the authorities.

But, most people will say, "What's in it for me?", especially those who have been previous members.

Aside from the fact that 'you get out of it what you put in', there are still a few special advantages.

For example: Repeaters, *Amateur Radio* magazine, Disposals and a correspondence school at better than a quarter the cost of commercial schools.

Look up the advantages yourself, here are a few more ... books, QSL bureau, contests. Any one of the above advantages can be well worth the initial investment of the membership fee.

Which brings me to my last point for the month ...

I have made a suggestion to the Victorian Divisional Council that with each membership there be given a Call Book and Regulations book. If this is to prove too expensive, I suggested that they be provided free to new members. I feel that the normal fee, less the cost of the books is better than no membership fee at all.

I would like to see a book list, with prices, included on the membership application form so that books can be ordered together with the membership fee in a lump sum.

If the correspondence course is listed it will provide an incentive for raw recruits to join as well. The main thing is for members to receive something a little more material for their money because, let's face it, we are living in a very material society.

Get those pens out and give me or the Editor, or better yet, your Division a bit of feedback!. Communication is what it is all about.

ar

INAUGURATION DATES OF RADIO SOCIETIES

WIA	Australia	1910
RSGB	United Kingdom	1913
ARRL	USA	May 18, 1914
CRRL	Canada	1920
SRAL	Finland	April 14, 1921
RCA	Argentina	October 21, 1921
RCC	Chile	July 12, 1922
GRC	Ecuador	May 9, 1923
UBA	Belgium	1923
REF	France	April 1925
SARL	South Africa	May 25, 1925
SSA	Sweden	September 10, 1925
OVSV	Austria	April 1926
RCD	Dominican Republic	June 12, 1926
JARL	Japan	June 12, 1926
NZART	New Zealand	August 16, 1926
ARI	Italy	January 1, 1927
EDR	Denmark	June 1927
DARC	Federal Republic of Germany	1927
NRRL	Norway	August 8, 1928
USKA	Switzerland	August 4, 1929
HARTS	Hong Kong	October 1929
PZK	Poland	February 23, 1930
RCP	Peru	December 6, 1930
LMRE	Mexico	January 10, 1932
PARA	Philippine	November 1932
IRTS	Ireland	1932
LCRA	Colombia	August 13, 1933
MARL	Malta	1933
RCU	Uruguay	1933
LABRE	Brazil	February 2, 1934
CORA	French Polynesia	1934
FRR	Rumania	1936
RL	Luxembourg	March 7, 1937
JARA	Jamaica	February 17, 1939
RCB	Bolivia	March 1, 1940
RCP	Paraguay	January 23, 1941
CREN	Nicaragua	September 15, 1945
VERON	Netherlands	October 21, 1945

From *JARL News* April 1986

VK ZL OCEANIA CONTEST

1985 Results & 1986 Rules

Jock White ZL2GX
NZART CONTEST AND AWARDS MANAGER

Greg Williams VK3BGW
WIA VK/ZL/O CONTEST MANAGER

Following are the results of the 1985 VK/ZL/O Contest. There was certainly a lull in propagation, particularly over the phone weekend. This was the 50th running of the contest and also celebrated the 75th Anniversary of the WIA. To commemorate these events, the WIA Executive provided special awards in the form of medallions for the winners of the contest.

In addition, Fred Mackiewicz, of Am-Comm Electronics, provided a special prize of an Antenna Rotator to the top Australian scorer in the contest. The rotator will shortly be presented to VK2APK.

The logs were of a generally high standard, however some were not acceptable. It amazes me that someone can operate for 24 hours in a contest and work hundreds of contacts and then skimp on the paper work. The logs are the only information the Contest Manager has to work from. If call signs are unreadable and there are too many un-noted duplicate contacts, then these contacts must be deleted from the log. Too many of these deletions and the log is unacceptable. Refer to the Contest Column this month for more information on disqualification of Contest Logs.

When signing a declaration that you have abided by the rules, then do so! Don't declare that you have abided by the rules and then break them. Declare that "I abided by the rules except I did not have a separate log beginning at 011 for each band", or "I calculated my score in the method I think best and not as stated in the rules." At least this is an honest approach. Take a carbon copy of your log by all means, but keep it as your record and send the original in. Trying to read the 20th page produced by the one piece of carbon paper is very difficult and can lead to the disqualification of your log.

This will be my last year as VK/ZL/O Contest Manager. I can hear cheers of joy from many, but to those who are cheering I ask this one question — where were you when no one could be found to do the job? I have enjoyed the experience, but did not appreciate the amount of work involved and would not recommend the job to anyone who has a family and other commitments.

To those who helped me and sent encouraging comments; *thank you.* To those who sent criticism and other comments, *thank you too.* I appreciate that too, for it told me how people felt and thought. To those who hassled a whole lot of people, including abusive phone calls to my wife, no *thanks at all!* If you have a grievance with me, talk to me, not others who have no control over what is happening.

Now to the results. The call signs in bold type will receive an award. Where there was little competition or little effort required, no award has been made. A station can receive only one award for each mode. The numbers in the "band" column are the number of contacts followed by prefixes, see the rules on page 22, September 1985, *Amateur Radio* for the method of calculating the final score. The DX results should be in next month's AR and once they and the awards are out, I look forward to having some operating time again.

All check logs will be acknowledged with the DX Results.

SOAP-BOX

Propagation conditions on 14 MHz and the number of stations operating were most disappointing — VK2ABC

Where was 10 metres? Found that the quad got into the television on 15 metres just when the band opened to Europe, gee did the wife growl — ZM1IM

High noise and QRM resulted in reports like 399! — VK3AMD

Conditions were very bad ... only entered to show appreciation for running the contest — VK4BRZ

Not a good contest this year, lost time due to oversleeping, power failure, solid QRN and than conditions were atrocious ... I quit with a splitting headache — VK2AOF

Strange that nobody was heard on 160 metres — ZL1BXW

Had expected more activity from VK/ZL on 160 and 80 metres — ZL1BN

I only started to give out a few numbers, but the excitement and enjoyment increased ... — ZL4BQ (Welcome to contesting).

ar

AUSTRALIAN PHONE SECTION — 24 hours

CALL SIGN	160	80	40	20	15	10	TOTAL
ALL BAND							
VK2KL	15,8	99,33	164,98	134,73	91,45	0,0	623 482
VK2APK	33,10	88,21	158,113	75,46	70,47	0,0	607 431
VK6FO	1,1	0,0	304,97	118,67	107,67	1,1	436 875
VK2PS	37,13	16,6	10,10	78,38	39,22	0,0	98 434
VK4BKM	0,0	1,1	0,0	180,93	40,22	0,0	31 320
VK4KWO	0,0	33,9	0,0	0,0	36,25	0,0	13 668
VI3SM	0,0	8,5	13,13	26,18	0,0	0,0	6 156
VK3DOM	0,0	26,11	0,0	8,6	0,0	0,0	4 556
VK6ATE	0,0	6,5	0,0	46,29	0,0	0,0	3 604
VK5AGX	0,0	16,7	0,0	10,10	0,0	0,0	2 890
VK2AIC	0,0	2,2	0,0	17,14	14,13	0,0	1 885
SINGLE BAND							
VK4SF	0,0	0,0	38,30	0,0	0,0	0,0	5 700
VK4PJ	0,0	0,0	0,0	124,77	0,0	0,0	9 548
VK2ABC	0,0	0,0	0,0	37,25	0,0	0,0	925
VK4KAE	0,0	0,0	0,0	0,0	18,10	0,0	360

AUSTRALIAN PHONE SECTION — 8 hours

VK2BQS	11,7	30,10	0,0	49,28	71,42	0,0	61 857
VK6RG	2,2	6,4	7,7	129,83	0,0	0,0	25 344
VK1LF	1,1	30,12	0,0	0,0	0,0	0,0	4 160

NEW ZEALAND PHONE SECTION — 24 hours

ALL BAND							
ZM1BQD	0,0	157,92	270,129	220,149	0,0	0,0	1 161 800-
ZL1AAS	39,17	125,52	108,81	239,143	118,50	0,0	1 044 435-
ZL1AIZ/2	22,10	88,41	77,62	27,22	0,0	0,0	233 820
ZL3HT	18,7	54,21	0,0	14,10	0,0	0,0	35 646
ZM1IM	0,0	12,9	10,9	61,34	5,5	0,0	13 452
ZL3TX	17,6	28,12	0,0	0,0	0,0	0,0	11 160
SINGLE BAND							
ZL4BQ	0,0	99,70	0,0	0,0	0,0	0,0	69 300

NEW ZEALAND PHONE SECTION — 8 hours

ZM2AFY	0,0	57,33	0,0	0,0	0,0	0,0	18 810

AUSTRALIAN CW SECTION — 24 hours

CALL SIGN	160	60	40	20	15	10	TOTAL
ALL BAND							
VK2APK	8,4	60,19	227,124	313,160	116,62	0,0	900 360
VK2PA	0,0	24,15	403,197	149,72	111,56	0,0	892 840
VI4XA	0,0	18,10	206,100	268,127	149,67	1,1	542 595
VK2AYD	0,0	19,11	260,128	200,106	55,33	0,0	500 400
VK6AJ	0,0	9,6	34,27	284,126	204,112	0,0	257 992
VK6DU	0,0	0,0	107,77	29,17	213,120	0,0	211 860
VK2AQF	0,0	21,13	124,66	85,57	24,8	0,0	148 302
VK5GZ	0,0	21,10	30,24	136,80	62,40	0,0	95 480
VK6IT	0,0	3,3	102,71	38,28	38,28	0,0	85 020
VI3XB	0,0	73,41	19,18	26,18	12,9	0,0	75 250
VK5AGX	0,0	18,12	16,12	166,86	32,25	0,0	66 150
VK3DNC	2,2	13,8	81,49	39,27	1,1	0,0	50 112
VK3MJ	0,0	0,0	52,12	148,40	30,16	0,0	31 824
VK2SU	0,0	10,4	22,13	42,22	0,0	0,0	9 828
VK1DA	0,0	0,0	18,16	52,27	0,0	0,0	6 106
VK5BS	0,0	0,0	24,22	10,9	4,4	0,0	4 830
VK2DID	0,0	0,0	0,0	66,47	6,6	0,0	4 134
VK4BRZ	0,0	7,5	0,0	17,12	23,14	0,0	4 123
VK2AIC	0,0	0,0	0,0	16,13	15,11	0,0	1 104
SINGLE BAND							
VK2KI	0,0	3,2	0,0	0,0	0,0	0,0	60
VK3MR	0,0	0,0	367,189	0,0	0,0	0,0	346 815
VK4SF	0,0	0,0	32,26	0,0	0,0	0,0	4 160
VK5ARC	0,0	0,0	0,0	362,168	0,0	0,0	60 816
VK4TT	0,0	0,0	0,0	249,116	0,0	0,0	28 884
VK4BKM	0,0	0,0	0,0	36,26	0,0	0,0	936

AUSTRALIAN CW SECTION — 8 hours

ALL BAND							
VK2PS	0,0	7,5	14,13	43,29	52,29	0,0	21 812
VK2BQS	0,0	0,0	0,0	8,6	10,9	0,0	476
SINGLE BAND							
VK3AMD	0,0	0,0	20,16	0,0	0,0	0,0	1 600
VK3RJ	0,0	0,0	0,0	0,0	43,25	0,0	2 150
VI3KS	0,0	0,0	0,0	0,0	20,16	0,0	640

NEW ZEALAND CW SECTION — 24 hours

ALL BAND							
ZL2BR	0,0	22,15	232,123	176,81	71,38	0,0	436 386
ZL1AIZ	6,4	100,64	135,94	55,42	18,15	0,0	413 034
ZM2AGY	0,0	16,10	315,165	44,24	10,8	0,0	372 393
ZL1BN	5,3	60,36	143,96	51,40	39,27	0,0	303 808
ZL3HT	1,1	8,5	0,0	0,0	0,0	0,0	600

There were no Single Band entries received in this category.

NEW ZEALAND CW SECTION — 8 hours

ALL BAND							
ZL1BXW	0,0	11,10	134,95	14,13	39,27	0,0	126 440
ZL1HV	0,0	6,4	7,7	100,56	59,28	0,0	29 735

There were no Single Band entries received in this category.

The following logs were rejected as unacceptable or late — VK5MS and VK5BJA.

VK ZL OCEANIA DX CONTEST — Rules for 1986

This year the Contest will commemorate the 60th Anniversary of NZART.

FOR OVERSEAS ENTRANTS

1 a. SSB — Within a 24-hour period from 1000 UTC on Saturday, October 4, to 1000 UTC, Sunday, October 5.

1 b. CW — Within a 24-hour period from 1000 UTC on Saturday October 11, to 1000 UTC, Sunday, October 12.

Special conditions for both SSB and CW — During this time a maximum of 12 hours operating time will be done — in one hour blocks — based on the "even hour to the even hour" in UTC; eg 1000 UTC to 1100 UTC // 1300 UTC to 1400 UTC, etc with minimum periods of one hour.

1 c. RECEIVING — SSB and CW combined in above times (maximum total of 24 hours).

2. Only one contact per mode per band is permitted. All bands may be used except WARC bands.

3. Scoring: For stations operating outside Oceania, score two points for each contact with VK/ZL or Oceania stations. Oceania stations score two points for all contacts.

4. Final Score: Multiply total QSO points by the sum of all VK/ZL/O prefixes worked on all bands. (The same VK/ZL/O prefix worked on a different band counts as a different unit). *NOTE: Oceania stations are those which qualify as Oceania for WAC.*

5. Ciphers: Five or six digit numbers composed of the RS/T report plus a three digit sequence number beginning at 001 and increasing by one for each QSO on that band.

6. Logs: Separate log sheets should be used for each band and for SSB/CW.

Logs should show: *Date, Time in UTC, Call of Station Worked, Ciphers sent and received.*
Underline each new VK/ZL/O prefix.
State QSO points claimed for each band.
State VK/ZL/O prefix claimed for each band.
Attach a Summary Sheet showing: *Call Sign, Name, Address, Total QSO Points Claimed on all bands, Total VK/ZL/O Prefixes Contacted on all bands, Total Points Claimed and a declaration stating that all rules were observed.*
Logs should be posted to NZART Contest Manager, ZL2GX, 152 Lytton Road, Gisborne, NZ, to arrive prior to February 15, 1987.

7. SWLs: A VK/ZL/O station must be heard in a contest QSO. Logs are to be set out as for the transmitting section.

8. Awards: Separate awards will be issued for SSB and CW.

a. A plaque for the top scorer in each continental area.

b. Special large coloured certificates showing Mount Cook (New Zealand's highest mountain) will be awarded to the top scorers in each country.

c. Participation certificates will be issued to all other on request — one IRC for postage please.

A copy of relevant results are available upon request — one IRC please.

FOR VK/ZL STATIONS

Check with overseas rules. Rules 1, 2, 5, 6 as for Overseas Stations. Exception . . . Rule 6.

3. VK/ZL stations are permitted to contact each other only on 160 and 80 metres. VK/VK; ZL/ZL and ZL/VK contacts are all permitted on these two bands.

4. Scoring: Different points are allocated for contacts on different bands as follows:

160 metres — 20 points
80 metres — 10 points
40 metres — 5 points
20 metres — 1 point
15 metres — 2 points
10 metres — 3 points

TOTAL SCORE will be the total QSO points multiplied by the total number of prefixes worked. The same prefix worked on a different band is counted.

NOTE: K1, W1, AA1, N1 etc are all different prefixes. W1AAA/6 would count as W6 and not as W1.

6. CHANGE . . . logs to arrive by December 5, 1986.

7. SWL Section: As for overseas but . . .
VKs must hear and log ZL or other stations (no VK stations).
ZLs must hear and log VK or other stations (no ZL stations).
VKs/ZLs do not log each other.

8. Awards: Separate awards will be issued for SSB and CW.

a. Trophies to be announced by NZART and by WIA.

b. Special large coloured certificates showing Mount Cook will be awarded to the top scorers in each prefix area and to the top scorers on each band.

c. Participation certificates will be issued to all other on request — one IRC or 50 cents for postage, etc.

73 and good operating
Jock White ZL2GX
NZART Contest Manager
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International News

INTERNATIONAL TRAVEL HOST EXCHANGE

The number of participants in the IARU International Travel Host Exchange program is expanding. The latest list received from the ARRL International Programs Manager, Naoki Akiyama JH1VRQ/N1CIX, is printed below.

Members of the ITHE program are willing to either exchange accommodation or to host visiting amateurs. If you would like to participate in this program or desire further information, please write to the Federal Secretary, WIA, PO Box 300, Caulfield South, Vic. 3162.

Australia
William Wells VK1WB[E].

Austria
Enrico Schuerrer OE1EQW[EG]. Mr and Mrs Horst Sommer OE3OOW and OE3YTW[EG].

Canada
Kenneth Pineo VE1BAK[E]. Mr and Mrs John Franklin VE2EDN and VE2EDO[E]. Tom Kennedy VE3NK[E]. Mike Goldstein VE3GFN[E]. Mr and Mrs Vic Cronin VE3LFS and VE3LFJ[E]. Blair Shaw VE6AGH[EF]. Arnold Rivett VE6AXB[EFGS]. George Cserenyi VE7CIZ[EGH]. John Foss VE7ML[ENSW].

France
Guy Legendre F6GRU[F]. Alain Bignon F6GWX[EF].

Germany (FRG)
Heinz Lange DL7CL[EG]. Heinz Reese DJ2EA[EG]. Heiko Damm DL9FA[EG]. Hedwig Chemelewski DG4MCT[EFGIR]. Gerhard Eberlein DF2NR[EG].

India
M G Karnik VU2CK[EHI]. Joysree Mukherjee VU2JB[EFHR]. Mukesh Chandra VU2MCC[EHI]. V Natraj VU2RNY[EHI].

Japan
Kaorui Oeda JA6PRM/1[EJ]. Tetsuo Okazawa JH1FLS[EJ]. Katsumi Kosugi JP1QZZ[EJ]. Tomio Shimada JA1SGW[EJ]. Tetsuji Yamada JA1EQZ[EJ]. Mariko Ichikawa JP1TVK[EFJ]. Nagao Ogawa JF1UFX[EJ]. Tatsumi Inoue JP1CHT[EFGJ]. Kazuhito Tokuda JJ1GDZ[EFJ]. Hidemitsu Katsura JR1UTS[EFJ]. Hitoshi Oyama JP1AAZ[EJ]. Masao Kawakami JI1NXS[EJ]. Mitsuo Ogura JR1CXW[EJ]. Takuya Hayashi JS1NHL[EJ]. Kenichi Morimoto JA1GAL[EJ]. Yutaka Sakai JF2GAE[EJR]. Shin'ichi Ohkawa JH2SGC[EJ]. Yukio Sugimoto JA2AJF[EJ]. Yasuyuki Suzuki JR2BEF[EJ]. Ryuichi Sakai JA2GSQ[EJ]. Kiyotaka Hagiwara JA2ITT[EJ]. Tsunemitsu Yagi JJ2GDE[EFJ]. Ichiro Hoshiya JA2WY[EJ]. Mr and Mrs Masatoshi Yasuda JE2HCG and JI2FSY[EJ]. Tetsu Harada JF2NNE[EJ]. Takeyoshi Nakai JA3HIY[EJ]. Takashi Oki JA3BLC[EJ]. Masao Sano JE1NHF/3[EJ]. Masao Mochizuki JL3TIA[EJ]. Akiko Nakatani JM3CYI[EJ]. Hiroshi Tsuji JG3RPS[EJ]. Sadao Ikeda JJ3UJN[EGJ]. Tadao Mikado JR3ENR[EGJ].
Kiyotaka Karashima JE4CCH[EJ]. Shigeru Ueda JR4QZH[EJ]. Masayo Kurokawa JR5MVX[EJ]. Kunihiko Furumi JA6CNL[EJ]. Gen'ichi Sato JA6BMB[EJ]. Akira Furukawa JG6FAJ[EJ]. Kelichiro Imarmura JA6GW[EJ]. Ichiu Mukai JE6VKK[EJS]. Toshihiko Ino JH6JTE[EJ]. Koichi Osaki JA6ERV[EJK]. Takashi Tomiyama JA6LDD[EJ]. Tetsuko Shirakawa JF7STU[EJ]. Naoji Saito JA8JLE[EJ]. Yoshiaki Nishizato JH8MTE[EJ]. Elichi Takahashi JA9OVX[QEJ]. Ryo Fukuda JA9CCG[EJ]. Shin'ichi Watanabe JA0DAI[EJ]. Hirokazu Murata JH0KJM[EJ].

Ireland
Liam Lyons EI2FB[E].

Italy
Mario Gori IV3KMR[EFGIRS].

Jamaica
E Munroe 6Y5EE[E]. W Bethune 6Y5IC[EG]. G McDowell 6Y5MC[ES]. Riaz Ahamed 6Y5NR[E].

Kenya
A J Oakley 5Z4DJ[E].

Lesotho
Gunter Barak 7P8CI[EG].

Liberia
Walcott Benjamin EL2BA[E].

Netherlands
J H Melein PE1INS[DEG]. H van Oosterhout PA3AWW[DEFGRS]. A H Proeme PA0MMA[DEFG].

New Zealand
Mr and Mrs Dave Johnston ZL1AMN and ZL1ALE[E].

Sierra Leone
Wally Schramm 9L1FC[E].

Sweden
Gunnar Eriksson SM4GL[EGNSW]. Bernt Endermark SM5BST[ESW]. Pekka Vuoristo SM7OQU[EFGSW].

Switzerland
Mr and Mrs Joerg Meier HB9CBQ and HB9CKS[EFG]. Mr and Mrs Kurt Kruesi HB9CVF and HE9SNQ[EG].

Syria
Technical Institute of Radio YK1DF[AE].

United Kingdom
Robert Heselwood G4UYI[EF]. Sam Kennard G4OHX[EG]. T Owen G4PSH[E]. Elaine Green G0ATS[E]. Cheshunt and District Amateur Radio Club G4ECT/G6CRC[E]. Roger Brown G3LQP[E]. Richard Schiller GI4WTG[E].

United States
Mr and Mrs Phillip Sager WB4FDT and KB4MBF[EF]. David Chase KA1IUC[E]. Richard Baldwin W1RU[E]. Jim Fitton W1FMR[ES]. Georges Vedie KA1LQO[EFG]. Harold Rose KA1JUI[E]. Richard Marsino Jr[E]. Mr and Mrs Edwin Pores WA2ZBV and WB2URP[E]. Mr and Mrs Herbert Sweet K2GBH and WA2KCL[E]. Alvin Peachman WB2NFD[EG]. Lynn Finch W2MSJ[EG]. Mr and Mrs Anthony Faiola K3WX[EFGI]. Leon Hance W4YFZ[E]. Frank Butler Jr W4RH[E]. Mr and Mrs Stephen Gross N4PZ[ES]. Neil Foster KC4MJ[E].
Robert Foy WA4LLZ[E]. William Wiggins N4BMR[E]. Wilbur Woodruff N4KEY[E]. Carol Garner N5FYZ[EFS]. Mr and Mrs Al Markwardt W5PXH[EG]. Jackson Daugherty N5FKE[EFJ]. Mr and Mrs Monty Bancroft W6NJW[E]. Mr and Mrs Jim Price K6ZH and N6KIM[EFGS]. Mr and Mrs Nick Hauck K6QPE and K6SYB[EJS]. Ross Forbes WB6GFJ[EF]. Gail Brownell KB6EZB[EF]. Scott Rathjen W7SW/6[E]. Mr and Mrs James Eldredge K6TL[EFJS]. Roy Blankenship W6LRT[E]. John Tiernan KA6LNC[E]. Jack Allen N7DMP[E]. Mr and Mrs Alan Roeul KO7B and KA7QEV[E]. Phil Gray KA7TWQ[E].
Joe Frani K7MN[E]. Mr and Mrs Austin Quinn WB8SXM and KA8LMF[EF]. Bill Wilson WA8YTM[E]. Mr and Mrs Stuart Oserman WA9ZPL and KA9JLH[EF]. Alex Scherer W9EU[E]. Rollen Brandt K9VQK[E]. Larry Steele K0UKO[E]. Mr and Mrs Bob Ludtke K9NWM/0 and N0DBY[EF]. Bruce Frahm K0BJ[EGS]. Vern Skretvedt KA0KWM[EN]. Mr and Mrs Lee Bergren W0AR[ES]. Mr Ed Eichler WB0BCB[ES].

A=Arabic; D=Dutch; E=English; F=French; Fi=Finish; G=German; H=Hungarian; Hi=Hindi; I=Italian; J=Japanese; K=Korean; N=Norwegian; R= Russian; S=Spanish; Sw=Swedish

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Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

AUGUST
- 2- 3 *Tenth WA Annual 3.5 CW Contest (Rules this issue)*
- 9-10 *European CW Contest (Rules this issue)*
- 16-17 *Remembrance Day Contest (Rules July issue)*
- 16-17 *New Mexico QSO Party*
- 16-17 *SEA-net SSB Contest (Not Official, see below)*
- 23-24 *All Asian CW Contest (Rules June issue)*

SEPTEMBER
- 6- 7 *Tenth WA Annual 3.5 SSB Contest (Rules this issue)*
- 13-14 *European Phone Contest (Rules this issue)*
- 20-21 *Scandinavian CW Activity*
- 27-28 *Scandinavian SSB Activity*

OCTOBER
- 4- 5 *VK/ZL Oceania Phone Contest (Rules this issue)*
- 4- 5 *IRSA World Championship*
- 11-12 *VK/ZL Oceania CW Contest (Rules this issue)*
- 15-17 *YLRL Anniversary CW Party*
- 18-19 *1986 Fall CW Contest (Rules this issue)*
- 18-20 *CARTG RTTY Contest*
- 25-26 *CO WW DX Phone Contest*
- 29-31 *YLRL Anniversary SSB Party*

NOVEMBER
- 8- 9 *Australian Ladies Amateur Radio Association Contest*
- 8- 9 *European RTTY Contest (Rules this issue)*
- 29-30 *CO WW DX CW Contest*

CONTEST DISQUALIFICATION CRITERIA

A standard approach is taken to the disqualification of logs entered in all of the contests which come under the direct control of the Federal Contest Manager appointed by the Federal Executive.

A perusal of these criteria will show them to be quite fair and well thought out. They are based on those used by the ARRL in administering their contests. It is suggested that you take note of this particular issue of the magazine for reference to these general rules in the case of all contests for the ensuing year. Details are as follows:

DISQUALIFICATION — An entry in WIA conducted contests may be disqualified if, upon checking of logs, it is necessary that the overall score be reduced by more than two percent. Score reduction does not include correction of arithmetic errors. Reductions may be made of unconfirmed QSOs or multipliers, duplicate QSOs or other scoring discrepancies. An entry will be disqualified if more than two percent duplicate QSOs are detected as being claimed for credit. For each duplicate or mis-copied call sign removed from the log by the Contest Manager, a penalty of the deletion of three additional QSOs of equivalent value to the offending claim may be applied. The penalty will not be considered as part of the two percent disqualification criterion. If a participant is disqualified under these afore-mentioned provisions that operator will be barred from entering the contest for that particular mode in the ensuing year; eg disqualification from the 1986 RD Contest, Phone Section will prohibit an entry for the 1987 RD Contest, Phone Section. However, participation in the 1987 RD Contest's CW Section would be allowed.

Logs which are very untidy, illegible or incorrect in layout to a major degree may also be disqualified. The call signs of disqualified participants may be listed in *Amateur Radio* magazine, together with the contest results.

SEA-net SSB CONTEST

The rules of this contest were not received in time for publication in the July issue of this column. The CW section therefore has come and gone. It is a pity that the organisers have seen fit to hold the SSB section on the same weekend as the *Remembrance Day Contest*, however, our contest is, from my point of view at least, the major of the two. It is held on the same weekend every year, however one cannot expect that all overseas contest organisers will be aware of that. I know there are various VK operators who join in SEA-net on a regular basis — I used to do so myself.

Anyone who wishes to try the SEA-net contest will most likely suffer severe QRM due to the Remembrance Day Contest. Last year both the SARTG RTTY and the KCJ Contests were held on the same weekend as the Remembrance Day Contest. This year I have heard nothing of either contest. With the large number of events which occur, it is quite difficult keeping track of them each month.

I do try to bring you the rules for as many contests as I can, within reason, and at times must make a valued judgment as to whether or not a particular contest warrants publicity or has any major attraction for Australian amateurs.

RULES FOR SEA-net — In view of our close relationship with the other SEA-net countries, here are the details of the SEA-net SSB Contest — perhaps next year the two will not clash!

TIME — This has not been quoted in the rules which I have to hand. The date is August 16-17 and I would suggest that you may be able to sort out this problem by contacting some stations in the SEA-net area.

OBJECT — Is to contact stations within the SEA-net area. The same station may be worked once on each band. Cross-band or Cross-mode contacts are not allowed. Multi-operator stations are limited to one signal during the same time period.

CLASSES — Single operator, single and all band, and multi-operator all band only.

EXCHANGE — RS/T, plus a three figure QSO number starting with 001.

SCORING —

Stations outside SEA-net area: Contacts with stations within the net area with the following prefixes — 20 points on 160; 10 points on 80 and 40, four points on 20, 15 and 10 metres. Prefixes: DU, HS, YB, 9M2, 9M6, 9M8, 9V1, V85. Contacts with stations outside the net area: 10 points on 160; five points on 80 and 40; and two points on 20, 15 and 10 metres. Contacts between stations outside the net area have no value. There is a multiplier of three for each net country worked.

Stations within SEA-net area: Contacts with stations outside the net area — 10 points on 160; five points on 80 and 40; two points on 20, 15 and 10 metres. Contacts between stations within the net area: six points on 160; three points on 80 and 40; one point on 20, 15 and 10 metres. Contacts with stations in own country have no value. There is a multiplier of two for each net country worked; and three with country outside net area.

FINAL SCORE — Total QSO points times the sum of the multiplier.

AWARDS — The three highest scoring stations on CW and on SSB will receive plaques. There are other awards for each class.

Entries must be received no later than October 20, by the CEBU Amateur Radio League, PO Box 304, Cebu City, Philippines 6401.

SEA-net AREA PREFIXES — A35, A51, AP, BV, BY, C21, DU, FK8, FR, FW8, HL, HS, H44, JA etc, JD1, KA, KC6, KH2 to KH0, KX6, P29, S2, S79, T2, T3, VK all, VQ9, V85, VS6, VU2, VU7, XU, XE5, XW8, XX9, XZ2, YB, YJ8, ZK, ZL all, 3B6, 7, 8, 9, 3D2, 4S7, 5W1, 8Q7, 9M2, 6, 8, 9N1, 9V1 and 1Z9.

As Federal Contest Manager, but that I have a duty to not only make out rules, check logs and carry out all the other mundane tasks which are the lot of the Contest Manager, I believe that I must undertake other activities in connection with this office.

The Contest Manager should do as much as he can towards becoming the recognised expert on contesting in its various forms. He should be available as a resource to other officers of the Institute and be able to provide sound and informed advice when it is needed.

Such matters as helping to formulate policy, making suggestions as to what actions should be carried out to improve contesting for the benefit of all amateur radio operators, corresponding with others, including the Federal Office and Councillors, and doing my best to promote discussion amongst members on contest matters are all part of this approach.

In these notes you will read of anothers opinion on contest matters and also some personal opinions of my own. I would like to see this column become a forum for informed and logical discussion of contest matters and other subjects allied to amateur radio, apart from the privilege we have of expressing opinion through *Over to You!*

In line with the approach just outlined, in late May I circulated a Discussion Paper dealing with various aspects of VHF/UHF operation in contests. I now provide a copy of that paper with the intent of keeping you better informed as to what is going on with the Contest Manager and what is being suggested. Copies of this paper were forwarded to all Federal Councillors and the Federal Executive.

VHF/UHF ASPECTS OF CONTESTS — *A DISCUSSION PAPER*

It is suggested that we look at the history of contests within Australia and see just what has occurred with regard to VHF/UHF participation.

NATIONAL FIELD DAY

Following WWII, this contest was instituted with HF operation being utilised. Later as VHF operation became easier to achieve and, thus more popular, such operation was added. Problems have existed with this situation and various attempts have been made to overcome them.

As VHF was obviously not a popular aspect of the Field Day, I deleted the VHF-only Section from the contest. At the same time, I made an attempt to attract more operators to VHF by including a provision for multipliers for distance worked on VHF. I received a fair amount of criticism for this approach, which, upon consideration, was possibly warranted. I then modified the rules by reinstating VHF as a separate section. The application of multipliers for distance concept was retained. This resulted in a minimal increase in entrants in the VHF section.

Thus it can be seen that problems exist with VHF included in this contest and that the action taken does not solve the problems that exist.

REMEMBRANCE DAY CONTEST

This contest was inaugurated as an HF contest only. VHF was added. Now HF and VHF are separate categories. This approach may have solved the difficulties which have existed although there does appear to be less interest from VHF-only operators in this contest.

This contest should remain as it is, at least for the present.

Ron Henderson VK1RH, is currently looking at some of the other aspects of this contest.

ROSS HULL MEMORIAL CONTEST

This contest is held during the summer period in which the best VHF/UHF propagation conditions might be expected. As a general contest it receives very little support.

It basically only exists as an exercise for home stations which are highly specialised in the field of VHF through to microwave frequencies. These stations are generally fairly elaborate with large antenna systems and a wide range of equipment. The contest in its present form is virtually an "elitist" contest.

There have been many changes to the rules over a period of years in attempts to make it more attractive. Such attempts have resulted in still no support for this contest as well as severe criticism of the various Federal Contest Managers concerned.

There have been many complaints received regarding the unfairness of the rules and scoring systems, that it is biased towards particular geographic locations, is only for specialists and operators who can devote days of operation to the contest, etc, etc.

The Federal Contest Manager has suggested in his report to the 1985 and 1986 Federal Conventions that consideration should be given to disbanding the Ross Hull Memorial VHF/UHF Contest in view of the minimal support received.

It is understood that Joe Gelston VK7JG, who is the VK7 Federal Councillor, may be looking at this problem.

SUGGESTION

I would suggest that difficulties mentioned above could be overcome by completely changing the approach to VHF/UHF Contest Sections as follows:

1. Delete VHF from the John Moyle Memorial Field Day Contest altogether.
2. Delete the Ross Hull Memorial VHF/UHF Contest from the calendar in its present format.
3. Implement a totally separate VHF/UHF Field Day Contest (ARRL and RSGB do this) and use this as a basis for the Ross Hull Memorial Contest.

This "new" contest should appeal to the majority of keen VHF operators and contesters and would allow entrants to participate on any scale they wished. The contest would be renamed the *Ross Hull Memorial VHF/UHF Field Day.*

This document is circulated at this stage for discussion purposes and comment only. It is proposed also, that details of this paper be included in the *Contest Column* in *Amateur Radio* magazine so as to allow as wide a discussion as possible to take place.

Signed: Ian J Hunt VK5QX
Federal Contest Manager

May 28, 1986.

I intend from time to time to feature a letter from a member who has written to me on the subject of contests. In this way I hope to encourage a wider discussion on contest matters which should be of benefit to us all. If you have any ideas along contest lines which you wish to air just drop me a line. If you can also provide a photograph of yourself and/or station that would be of interest too.

This month I have provided such a feature with Tom VK4OD, being the intrepid writer. Many may know Tom better under the call sign VK4NUN. He has been a very keen contester and has done very well over the years that he has been operating. Congratulations on your new call sign, Tom.

Tom's letter is virtually self-explanatory and he quotes as follows:

"I would also like to comment about Bob VK7NBF, whose letter you discussed in AR, May. I must support him in one sense re the CW part. It is not helping the CW Novice in a contest with only 10 kHz for CW and usually up here there are a couple of Taiwanese fishing boats with S9 signals in that segment! I would like to see — and I have said this before — that Novices on CW be allowed **for the contest only** a bit larger segment of the band — say 3.520 to 3.540 MHz or something of that order.

"However, I cannot agree with his assertion that full calls with 100 watts tend to blot everyone out. I have been on most Novices contests for five years on SSB and CW, with good success on CW and have found very few full call stations giving any trouble — not too many on. I get plenty from Alan VK4VAT, with his big country antennas and 30 watts! Hi! (Mind you, he probably curses me too).

"The only other comment which comes to mind and also one which I have spoken out about before is the WIA plug "Use our bands or lose them". Well, any evening the Novice Section of 80 metres is bedlam, but from 3.625 right up to the DX-window there are hardly any stations. There is

Tom VK4OD ex-VK4NUN. Tom's wife suggested when she took the photograph; "Put your fist on the key, 'cos its never off it!"

plenty of intruders — well not exactly — but there is tons of room for pleasant QSOs. I would say from my observations, that about half the stations in the Novice Segment are full call operators, which is only understandable with the number of club, award and special call nets, in which both class of licensee naturally partake. Hence, the same old story, a bit more space to encourage the Novice Operator."

Tom then goes on to comment about the 21 MHz band where the American Novice can go down to 21.100 MHz. "This section, 21.100 to 21.125 MHz, was, and still is, virtually devoid of any VK operators."

He continues regarding this band; "About five years ago, my club — the *Sunshine Coast ARC* — put a motion to the then WIAO Workshop, proposing that Novices on CW be given another 25 kHz down to correspond with the American Novice Section. This was carried, I think by 14 to 5 in favour, but was then thrown out by the Federal Convention.

"Okay Ian, you asked for feedback and you've got it! I know that CW is not very popular with newer guys but I also think the small space on 80 metres is a bit of a deterrent, too."

Well, there you are. Tom has had his say in this month's column. I wonder if others of you have like opinions or whether you may be inclined to disagree. No matter what, I would point out that it is up to you to raise matters such as these for discussion, take them to your clubs, workshops, and Divisions. If you feel that you are right you will finally win your point if you can present a proper and fair argument for your cause. Again, I emphasise that you should go about such things in the right way. I find myself most critical of those amongst us who just sit back and whinge, saying that the WIA should do something about *it*, when those complaining are not prepared to go to the smallest effort to try and solve their own perceived problem.

In many cases, I suspect that these persons squealing about matters are not even members of the Wireless Institute of Australia, but still expect our national organisation to do all that it can to protect them and their precious rights. In other cases, they are persons with a vested interest, in one way or another, in stirring up strife and bent on criticism of the WIA to serve their own egos, or for some form of nefarious gain. It is really time that the majority of united amateurs in this country, and by that I mean the majority united within the nationally recognised organisation, made it quite clear that they will not stand for fragmentation of the amateur fraternity/sorority which can be brought about by selfish and introspective attitudes being shown in some areas.

It is about time that those who are not members of the WIA woke up to reality. It does no good for them to think that they are so in the right that they can go to the authorities pretending that they represent the amateur service in this country.

There are those members who unfortunately are not really loyal to the organisation but utilise their membership for mere personal or political benefit. Such persons seem also to think that they have a right to demand that the WIA follow certain courses of action. It would seem to me that, whilst some of these types probably feel justified in what the do, it is unfortunate that they are often either young and relatively inexperienced or only relatively new to the WIA in terms of years of membership.

I would contrast such individuals with such as G Maxwell Hull or George Luxon, well-known names to those who are informed in Institute matters, who have faithfully played their part over many years. I would repeat my recent comment that I accept that the WIA is not perfect as an organisation, however, the best way to make a real contribution to our hobby is by being or becoming a member and working through the existing forums of the organisation which has served us well for many years. Change things if you will, but do it in this manner and your efforts will be rewarded with the result of having done something which will be seen always as worthwhile.

I would make yet one other plea, and that is — when you do attempt to place what may seem to be facts before other people, you check them out carefully first before bursting into print or putting out such information over the air. There are too many cases I have noted of not only inaccuracy, but downright deception and distortion of the truth. Some of this may be caused by ignorance of the true facts although even that cannot be condoned or excused. In other words, do your homework first!

Well, that should be enough of the "soap-box" approach for now. I do admit that I feel strongly about our hobby and the need for us to be united in our efforts, hence my comments from time to time along these lines. I also feel strongly about morality and truth. Too often these values are sacrificed for commercialism and expediency.

HF CONTEST CHAMPIONSHIP

I have not been providing progress scores for this competition due to the limited amount of time available to me. My personal feeling is that where operators are very competitive and have an interest in how well they are going in the competition, they will already have a fairly good idea where they stand. I therefore prefer to wait until all the contest results are available.

The results of the 1985 Championship have not yet been announced as I am still awaiting the publication of the results of the VK/ZL Contest for 1985. Until I have these I cannot finalise this matter, so please bear with me.

In my report to the Federal Convention I recommended that there should be two trophies for this competition, namely, one for the champion phone- operator and one for the champion CW-operator. That recommendation was accepted by the Federal Convention and I would expect that a new trophy should become available so that this decision can apply to this years (1986) event.

Amongst my recommendations to the Convention was that the current trophy be refurbished. This trophy was originally presented to the Institute by Peter VK4PJ. It is silver plated and has been lacquered to protect the plating. Such an approach is okay to a degree where the trophy is not handled or moved about very much.

The ravages of time have had their effect on the trophy and its appearance has deteriorated through no fault of anyone in particular. I have suggested that it be gold plated and have been advised that this recommendation was agreed to. (It might interest you to know that, generally speaking, gold- plating is cheaper than silver-plating and produces a more durable and attractive finish not normally requiring attention,

apart from the odd wipe with a soft cloth).

I also made the recommendation to the Convention regarding the rules for the HF Contest Championship. The rules, up until now, have been very broad and could have been applied in a number of different ways. To overcome some of the problems which existed and to ensure that the application of same would be consistent and unambiguous, I provided a set of proposed rules. These were adopted by the Convention with little amendment. I feel sure that the majority of you will agree with the Federal Council and will find the rules to be fair to all operators. I now provide you with the details as follows:

HF CONTEST CHAMPIONSHIP RULES

This contest championship competition will be conducted on an annual basis.

To be eligible for this competition entrants must have entered at least ***three*** of the ***four*** HF contests sponsored by the Wireless Institute of Australia each year.

A perpetual trophy will be awarded to the entrant with the greatest number of points gained under the terms listed below. The call sign of the winning operator will be inscribed on the trophy. A 'replica' trophy will also be presented to each annual winner for his/her retention.

The four contests concerned are as follows:

John Moyle Memorial Field Day Contest
Remembrance Day Contest
VK Novice Contest
VK/ZL Contest

Points towards the trophy competition will be awarded on the following basis:

For the top 10 scorers with 10 points for the highest score down to one point for the tenth position.

The points are to be allocated on a State basis. (Awarding points on a State basis overcomes any unfairness due to geographic/propagation advantages which may exist).

Points will only be allocated where five or more entries exist from any State.

OR

Points will only be allocated where the score is equal to at least 25 percent of the average of the top scoring logs from each State.

(Previous proviso/s overcome the problem where only one 'token' entry appears for a particular category/section from any State).

Points for the John Moyle Memorial Field Day Contest will only be allocated to stations who actually operate "In the Field"; ie Home Stations in the Field Day Contest are not eligible for points.

Club or Multi-operator stations are not eligible for points.

Points in the VK/ZL Contest are awarded for the *total* scored on Phone or CW. They are ***not*** awarded on an individual band basis.

In the event of a tie, joint champions will be declared.

CERTIFICATES

It was during last year that I was able to catch up on the backlog of certificates. Since then, making out of certificates has again fallen somewhat behind. You might remember that I referred in this column to the splendid work done by a work-friend, Florence Mudie, who has hand- lettered all the certificates for me. Following catching up on the backlog, I made a suggestion to the Federal Office that our President could perhaps show our appreciation to Florence for her work by way of a letter of thanks. Once this was done, I felt clear to present Florence with my request for more of her kind assistance. (She had in fact offered to help, in any case).

I can report that the matter of outstanding certificates is in hand and I will be sending them out as soon as they become available. You will realise that with them being individually hand-lettered it does take some time, however the results are certainly worthwhile.

Once again, I would like to record my personal thanks to Florence for her kindness in this matter.

JUBILEE 150

You have no doubt read, or heard, about the J150 Award which can be gained by working the required VK5 stations and amassing the needed points to gain this award. With the year half-way through, this award seems to be quite popular and whilst it is not regarded as a "contest", one could be forgiven for mistaking some of the operations as being somewhat contest orientated. There is rather a lot of fun attached to gaining this award. You need only listen to the nightly dog-piles appearing on the Jubilee Net frequency on 80 metres (3.586 MHz) to see what I mean. Might I suggest this activity to you.

It does not take too much to qualify once you catch up with some of the triple-certificate holders of the award, who can give out 46 points per contact per band. You can soon find yourself in a position to be able to help by giving out points to DX stations who, after they have the award, can then carry on with helping others in their turn to qualify.

Personally, I am finding this particular approach to an award, which is certainly a new way of doing things and which might catch on elsewhere, almost as much fun as straight contesting. Anyway, give it a try for yourself.

CLASHING CONTESTS

I recently received a telephone call from Don VK5NOD, who pointed out an anomaly in my notes in the June column. In the Contest Calendar I had shown the *All Asian Phone Contest* as being held on June 14-15, while the rules printed in the same issue showed the date for the contest as being June 21-22. Whilst I apologise for this anomaly, I also plead "Not Guilty". The dates in the Calendar were obtained from material supplied to me from overseas whilst the rules were placed in the magazine directly by having been sent to Melbourne for publication. It is a somewhat large task to keep track of the dates for all contests, however we try to do our best for you. I do trust that nobody has been greatly inconvenienced by this occurrence. In any case, we do again apologise if such did occur. I thank Don for bringing this to my attention.

The matter of contests clashing could be referred to at this time. The *VK Novice Contest* was scheduled for June 21-22, and has thus possibly clashed with the *All Asian Phone Contest. It is necessary for me to set the dates for our contests each year not much later than the middle of the preceding year. In setting dates I try to ensure that our contests do not clash with other major overseas events, however I may not always be able to achieve this aim. I quite often do not know just which weekend other organisations will choose for their contests, thus matters are made somewhat difficult. In the instance referred to above it is quite likely that selecting which weekend on which to run the particular contests may have become complicated due to the fact that the month began on a Sunday.*

The All Asian Phone Contest is usually held on the third weekend of the month and I possibly took the weekend of the 22nd to be the fourth weekend, which I believe would be the correct approach. (Or would it?). In any case, we can only try and do our best for you. If there is some other convenient way to sort out the mess of contests, I would like to know what it is?

Well, I believe that is enough of my dissertations for this month. I wish you all the very best for now. 73 de Ian VK5QX.

QRP ARCI 1986 FALL CW CONTEST

This contest is held from 1200 UTC Saturday, October 18, 1986 to 2400 UTC Sunday, October 19, 1986. Participants may operate a maximum of 24 hours.

Members give RST, State/Province/Country and QRP ARCI membership number. Non-members give RST, State/Province/Country and power output.

Stations may be worked once per band for QSO points.

Each member contact is five points, regardless of location.

Each non-member contact, on the same continent is two points.

Each non-member contact, different continent is four points.

Multipliers: S/P/C: The US and Canada do not count as countries (count States and Provinces only for W/VE). A S/P/C may be worked once per band for S/P/C multiplier credit. Add S/P/Cs separately for each band, one point each, then add up S/P/C points for all bands to arrive at the total S/P/C multiplier.

Power:

4-5 watts output x 2
3-4 watts output x 4
2-3 watts output x 6
1-2 watts output x 8
Less than 1 watt output x 10

More than five watts output will be counted as check logs only. The highest power used for any contact, any band, will determine the multiplier to be used for scoring the whole log.

Bonus multipliers apply for natural power (solar, wind, etc — with or without storage) x 2. With storage, storage cells must be charged by the natural power source within 48 hours preceding the start of and/or during the contest. Battery power x 1.5. No other source of power may be used at any time during the contest to qualify for these multipliers.

Suggested frequencies are: 1.810; 3.560; 7.040; 14.060; 21.060; 28.060; 50.360; 3.710; 7.110; 21.110; 28.110 MHz (please note that some of these frequencies are outside the VK allocation). No 30-metre (10 MHz) or 12-metre (24 MHz) contacts will be counted.

Call *CQ CQ QRP DE* (Call Sign).

Scoring: QSP points (total all bands) times S/P/C multiplier (remember, a S/P/C may be worked on more than one band and counts once on each band for S/P/C multiplier points) times power multiplier times bonus multiplier (if none, use 1) equals claimed score. Use of the scoring summary sheet will help avoid errors; summary sheets may be obtained by sending a large SAE and IRCs to the contest chairman.

Separate log sheets for each band is suggested for ease of scoring. Send full log data plus separate worksheet showing details and time/s off-air. No log copies will be returned. All entrants desiring results and scores please include a large SAE and IRCs. It is a condition of entry that the decision of the QRP ARCI contest chairman is final in case of dispute.

Certificates will be awarded to the highest scoring station in each S/P/C with two or more entries. In addition, Adrian Weiss W0RSP, is sponsoring a special *Milliwatt* Certificate to the highest scoring station in the less-than-one-watt category, provided there are two or more entries in that category.

Logs must be received by November 19, 1986. Logs received late or ones that are missing information will be used as check logs. Send logs to: QRP ARCI Contest Chairman, Eugene Smith KA5NLY, PO Box 55010, Little Rock, AR. 72225-0010.

The TENTH WEST AUSTRALIAN ANNUAL 3.5 MHz CW and SSB CONTESTS

Transmitting and Receiving

DURATION: CW — Saturday and Sunday, August 2 and 3. SSB — Saturday and Sunday, September 6 and 7. On both days between the hours of 1100 and 1330 UTC; ie five operating hours in all for each contest.

FREQUENCIES: All contacts to be made in the 3.5/3.7 MHz band using frequency allocation applicable to your licence conditions.

CALLING: Stations will call CO WAA using the three times three technique, infringement of this rule by the use of long CQ calls may entail disqualification as will pre-arranging of a QSO.

SCORING: Points for contacts are as follows:

Within Western Australia — five points per contact
WA to all Mainland Eastern States — two points per contact
WA to VK7 — four points per contact
WA to VK0 and Overseas — eight points per contact
Stations other than WA — three points per contact with WA stations only.

MULTIPLIERS: A multiplier of two per Western Australian Shire worked will apply to the final score. For Western Australian stations north of the 26th parallel a multiplier of 1.3 per contact confirmed.

CONTACTS: Stations may be worked twice on each night; ie once between 1100 and 1300 UTC and again between 1300 and 1330 UTC. These

contacts will count for points. Each time the contact for WA stations will take the form of an exchange of five characters comprising RS/T and Shire letters; eg a station in *Northam* sends 579NM or if in *Harvey* 579HY, this helps towards the Worked All Shires Award. Eastern states and overseas stations will send RS/T plus a running number start at 001.

LOGS: Contest logs are to be set out on one side of a quarto or foolscap sheet with columns headed as below.

DATE:	CALL:	OPERATOR:

TIME UTC	CALLRST WKD OUT	RST IN	SHIRE LETTERS	SHIRE MULTIPLIER	POINTS CLAIMED

Column seven to be totalled at the foot of the each page and the running totals brought forward. The last page to contain the following summary: Total number of points scored, Input power, Equipment and Antennas used, along with comments on the contest in general.

SWL participants score as above using the outgoing transmit score.

All logs to be addressed to WAA Contest Committee, 42 Kennedy Street, Melville, WA. 6156 and posted so as to reach the destination not later than October 10, for both contests. The results for both contests will be published in December's issue of *Amateur Radio*.

SHIRE LETTERS

1. Albany Town	AT	70. Leonora	LA
2. Albany	AL	71. Mandurah	MB
3. Armadale	AK	72. Manjimup	MP
4. Augusta Margaret River	AM	73. Meekatharra	MK
5. Bassendean	BA	74. Melville	MV
6. Bayswater	BW	75. Menzies	MZ
7. Beverley	BV	76. Merredin	MD
9. Boddington	BD	77. Mingenew	MW
9. Boulder	BD	78. Moora	MA
10. Boyup Brook	BB	79. Morowa	MR
11. Bridgetown Greenbushes	BG	80. Moseman	MS
12. Brookton	BK	81. Mukinbudin	MU
13. Broome	BE	82. Mullewa	ME
14. Broomehill	BH	83. Mundaring	MG
15. Belmont	BL	84. Murchison	MH
15. Bruce Rock	BR	85. Murray	MY
17. Bunbury	BY	86. Mt Magnet	MM
18. Busselton	BN	87. Mt Marshall	ML
19. Canning	CA	88. Nannup	NP
20. Capel	CL	89. Narembeen	NN
21. Carnamah	CH	90. Narrogin	NG
22. Carnarvon	CN	91. Narrogin Town	NT
23. Chapman Valley	CV	92. Nedlands	NL
24. Chittering	CI	93. Northam	NM
25. Claremont	CT	94. Northam Town	ND
26. Cockburn	CR	95. Northampton	NH
27. Collie	CE	96. Nungadin	NG
28. Coolgardie	CG	97. Peppermint Grove	PG
29. Coorow	CW	98. Perenjori	PJ
30. Corrigin	CS	99. Perth	PH
31. Cottesloe	CD	100. Pingelly	PY
32. Cranbrook	CK	101. Plantagenet	PT
33. Cuballing	CB	102. Port Hedland	PD
34. Cue	CU	103. Quairading	QG
35. Cunderdin	CD	104. Ravensthorpe	HT
36. Dalwallinu	DU	105. Rockingham	RM
37. Dandaregan	DN	106. Roebourne	RB
38. Dardanup	DP	107. Sandstone	SS
39. Denmark	DK	108. Serpentine Jarrahdale	SJ
40. Donnybrook Balingup	DB	109. Shark Bay	SB
41. Dowerin	DR	110. South Perth	SP
42. Dumbleyung	DG	111. Stirling	ST
43. Dundas	DS	112. Subiaco	SU
44. East Fremantle	EF	113. Swan	SW
45. East Pilbara	EP	114. Tambellup	TP
46. Esperence	ES	115. Tammin	TM
47. Exmouth	EH	116. Three Springs	TS
48. Fremantle	FM	117. Toodyay	TY
49. Gingin	GG	118. Trayning	TY
50. Gnowangerup	GP	119. Upper Gascoyne	UG
51. Geraldton	GN	120. Victoria Plains	VP
52. Goomalling	GM	121. Wagin	WN
53. Goanelle	GS	122. Wandering	WD
54. Greenough	GR	123. Wanneroo	WO
55. Halls Creek	HC	124. Waroona	WR
56. Harvey	HY	125. West Arthur	WA
57. Irwin	IN	126. Westonia	WS
58. Kalamunda	KA	127. West Pilbara	WP
59. Kalgoorlie	KL	128. Wickepin	WI
60. Katanning	KG	129. Wiluna	WU
61. Kellerberrin	KN	130. Williams	WL
62. Kent	KT	131. Wongan Ballidu	WB
63. Kojonup	KP	132. Woodanilling	WG
64. Kondinin	KD	133. Wyalkatchem	WY
65. Koorda	KD	134. Wyndham East Kimberley	WE
66. Kulin	KU	135. West Kimberley	WE
67. Kwinana	KW	136. Yalgoo	YD
66. Lake Grace	LG	137. Yilgarn	YN
69. Laverton	LV	138. York	YK

EUROPEAN DX CONTEST

The Deutscher Amateur Radio Club (DARC) invites all amateurs to participate in this contest.

Periods — The contest is held over three weekends — CW: August 9/10; Phone September 13/14; and RTTY November 8/9 — from 0000 UTC Saturday to 2400 UTC Sunday.

Bands — 3.5; 7; 14; 21; 28 MHz.

Classification — Single operator, all band; Multi-operator, single transmitter; Multi-operator/Single transmitter — stations are only allowed to change band one time within a period of 15 minutes. A quick band-change and return for working new multipliers is allowed.

Rest Period — Only 36 hours of operation out of the 48 hours are permitted for single operator stations. ***The 12 hours of non-operation*** may be taken in one, but no more than three periods at any time during the contest and have to marked in the log.

Exchange — A contest QSO can only be established between a non- European and a European station. Exchange the usual five or six digit serial number RS/T report plus a progressive QSO number starting with 001.

Points — Each QSO counts one point. A station may be worked once per band. Each confirmed QTC, given or received, counts one point (see below).

Multipliers — The multiplier for non-European stations is determined by the number of European countries worked on each band. Europeans will use the last ARRL countries list. In addition each call area in the following countries will be considered as a multiplier: JA, PY, VE, VO, VK, ZL, ZS, UA90 (see special regulations for RTTY). Each W/K-state will be considered a multiplier, but no W/K call areas.

The multiplier on 3.5 MHz may be multiplied by four

The multiplier on 7 MHz may be multiplied by three

The multiplier on 14/21/28 MHz may be multiplied by two

Scoring — The final score is the total QSO points plus QTC points multiplied by the sum total multipliers from all bands.

QTC Traffic — Additional point credit can be realised by making use of the QTC traffic feature. A QTC is a report of a confirmed QSO that has taken place earlier in the contest and later sent back to a European station. It can only be sent from a non-European station to a European station. The general idea being that after a number of European stations have been worked, a list of these stations can be reported back during a QSO with another station. An additional one point credit can be claimed for each station reported (note special regulation for RTTY).

(a) A QTC contains the time, call and QSO number of the station being reported; ie 1300/DA1AA/134. This means that at 1300 UTC you worked DA1AA and received number 134.

(b) A QSO can be reported only once and not back to the originating station.

(c) ***Only a maximum of 10 QTCs to a station is permitted.*** You may work the same station several times to complete this quota. Only the original contact, however, has QSO point value.

(d) Keep a uniform list of QTCs sent. QTC 3/7 indicates that this is the third series of QTCs sent and that seven QSOs are reported.

Contest Awards — Certificates to the highest scorer in each classification in each country, reasonable score provided.

Disqualification — Usual disqualification criteria applies.

Logs — Use separate sheets for each band. All entrants are required to submit cross-check (dupe) sheets for each band on which they worked more than 200 QSOs. For each duplicate contact that is removed from a log by the checker, a penalty of three additional contacts will be eliminated.

Special Regulations for RTTY — In the RTTY section of the European DX Contest also contacts between all continents and also one's own continent are permitted. Multipliers will be counted according to the European and ARRL Countries List. QSO as well as QTC traffic with one's own country is not allowed. SWLs apply to the rules accordingly.

Deadline — CW: September 15; Phone: October 15; RTTY: December 15.

European Countries List — C31, CT1, CT2, DL, EA, EA6, EI, F, FC, G, GD, GI, GJ, GM, GM Shetland, GU, GW, HA, HB, HB0, HV, I, IS, IT, JW Bear, JW Spitsbergen, JX, LA, LX, LZ, OE, OH, OH0, OJ0, OK, ON, OY, OZ, PA, SM, SP, SV, SV5 Rhodes, SV9 Crete, SV Athos, T77/M1, TA European Part, TF, UA 1346, UA2, UA Franz Josef Land, UB, UC, UN/UK1N, UO, UP, UQ, UR, Y22-99/DM, YO, YU, ZA, ZB2, 1A0, 3A, 4U1 Geneva, 4U1 Vienna, 9H1.

Mailing Address — WAEDC Committee, PO Box 1328, D-8950 Kaufbeuren, West Germany.

VI5JSA TO CELEBRATE COUNCIL CENTENARY

John Hampel VK5SJ
16 Mitchell Street, Glengowrie, SA. 5044

The WIA SA Division will operate a Special Event Station with the theme 'Service to the Community by Amateur Radio' to mark the centenary of Marion Council, which is celebrating 'A Century of Service' as a Jubilee 150 event in South Australia.

The District Council of Marion was proclaimed on September 2, 1886. It has grown to a population of over 70 500, covering the south-western Adelaide suburban area with extensive industrial development on the southern boundary.

As part of the South Australian Jubilee 150, Marion is sharing exchanges of historical material and personal visits with its J150 twin town, El Paso in Texas. On September 2, and exchange of greetings on 14 MHz is planned between Mayor Hodgers of El Paso and Mayor Hodgson of Marion.

On the same day, VI5JSA will be used to receive messages of congratulations from Mayors of South Australian country towns, who will speak via amateur radio through a network of VK5 stations who are co-operating in this project. These exchanges will take place on 3.500 MHz prior to the Councils Centenary Meeting in the evening.

The Special Event Station will include extensive historical displays of communications equipment and documents at the Marion Library. The organisers and the Council anticipate the operation of the station, together with static displays of various facets of the hobby, will attract attention to the roles of the Amateur Radio Service in the community.

VI5JSA will operate during library hours from August 26, to September 5, 1986, Monday; Wednesday; Friday 0001-1030 UTC and Tuesday; Thursday 0001- 0730 UTC. Jubilee 150 frequencies will be used; ie SSB — 3.586; 7.086; 14.186; 14.286 and 21.186 MHz. CW — 3.536; 7.036; 14.136 and 21.136 MHz. There will also be RTTY operation on 7 and 14 MHz. Local VHF and ATV will also operate.

A special JSA QSL card will be used and a Marion Centenary Award will be issued. Further details of this award will be in the Awards Column next month.

The organising committee would be pleased to hear from VK5s who would be able to assist during the operation of the Special Event Station, VI5JSA.

The Marion Council Centenary J150 Amateur Radio Co-ordinator is John Hampel VK5SJ, phone (08) 295 6751.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

Well, here we are in the depths of winter, definitely not the time of year for experimenting with aerials, etc. Never mind, we can still get the transceiver and the radio shack warmed up and find someone to talk to, even when propagation is at its lowest ebb.

RAG-CHEWING A LOVELY WAY TO SPEND AN EVENING

A little rag-chewing on the lower bands is a good way to pass the long evenings, and it is always pleasant to meet-up with old friends again for a chat, somewhat akin to "yarning with a neighbour over the back fence."

Perhaps we YL operators do share a special bond of friendship having its roots in the days when the main YL function was to provide sustenance for the OMs at social gatherings. Now-a-days, YL participation in amateur radio is firmly established and our members are steadily growing.

HOW DID ALARA BEGIN?

So how did ALARA, (or LARA, as it was known then), begin? I cannot vouch for the veracity of the following, and our historian, Mavis VK3KS, has written an excellent account which is doubtless closer to the truth, but it could have happened this way:

Some ladies met and said "You know it really is a bore,
To be stuck with kids and washing-up and every kind of chore.
Being XYLs of amateurs is really not so good
When they are working radio while we're preparing food!

We can't beat 'em, so let's join 'em, get some action of our own,
And a group of us together can do more than one alone".
So they formed a ladies' amateur group, and soon the OMs knew
They had competition on the air as LARA grew and grew.

Now things are very different, as all will soon agree,
And the YL role has changed a lot since LARA came to be;

During February 1986, Jenny VK5ANW, presented Marlene VK5QO, with her 75th medallion on behalf of the VK5 Divisional Council, at the home of Meg VK5AOV and David VK5OV.

So while YLs work the radio at all the social "dos"
The OMs are baby-sitting while they tend the barbeques.

In case any of our long-suffering OMs feel they are getting a raw deal, I would hasten to add that we are very appreciative of their continued support and encouragement in the hobby we all enjoy — amateur radio.

WIA ANNIVERSARY MEDALLIONS

Unfortunately, we omitted one recipient of the WIA 75th Anniversary Medallions (see June AR).

Joan Sutherland VK3NLO, — organisation of the *Bendigo Premier Town Award* and running the net.

Sorry about the oversight, Joan, and congratulations.

Jenny VK5ANW, presents Joy VK5YJ, with her 75th medallion on behalf of the VK5 Divisional Council at the VK5 YL get-together.

South Australian YLs get-together at the home of Meg and David, VK5AOV and VK5OV. From left: Denise VK5YL, Marlene VK5QO, Judy VK5BYL, Jenny VK5ANW, Joy VK5YJ and Meg VK5AOV.

MEMBERSHIP UPDATE

Following are amendments to the Membership List, as printed in July AR.

Associate Member for VK5 — Christine Taylor. Christine is a new member and we welcome you, Christine.

Associate Member for VK3 and VK6 — Rita Ashbury and Peggy VK6NKU. Both have re-joined and we welcome you both back, Rita and Peggy.

UPGRADED

Bron ex-VK3NTD/XTD is now VK3DYF and Josie ex-VK4VAN is now VK4VG. Congratulations on the new call signs, Bron and Josie.

73/33. See you next month, Joy VK2EBX.

ar

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton. SA. 5014

AWARDS ISSUED RECENTLY

WAVKA

1479 Kazumasa Kawase JG3HPL
1480 Akiyoshi Takahashi JA7AER
1481 Koichi Mori JH7FWA
1482 Mamoru Wakasugi JA8CAQ
1483 Eduard H Pandoe YC2AFP
1484 Abet Suhaian YB4FNN

DXCC PHONE

344 Bob Millgate VK4ADZ
345 Warren H Cure VK7CV
346 Tom D Dowling VK4OD

CORRECTION

The call signs of the club station for the Brisbane ARC Inc are VK4BA and VK4WIL.

THE ARANC *CAGOU AWARD*
New Diploma Colour

This diploma is offered to DX stations outside New Caledonia.

1. DX stations shall work six New Caledonia stations.
2. Contacts from January 1, 1972 or after are valid for this award.
3. Use any amateur band or mode.
4. Applicant shall submit normal log information. QSL cards are not required.
5. The application shall be sent together with 12 IRCs to: ARANC Award Manager, PO Box 3956, Noumea, New Caledonia.

The *Cagou Award* will be returned by air mail. Please allow 15 days for delivery.

SPECIAL PREFIX

To commemorate the 25th anniversary of the Amateur Radio Association of New Caledonia, all members of the club will use a special prefix during the period from August 9 to December 31, 1986 inclusive.

The prefix will be FK25.

At the same time, and for the same period, the club station will use the call sign FK25A.

In order to allow a maximum number of amateurs around the world to qualify for a commemorative award, members have pledged to be on air as often as possible for the full period.

The club station will also be activated quite frequently.

COMMEMORATIVE AWARD

1. PERIOD — from August 9 until December 31, 1986 inclusive. The date limit for award applications will be January 31, 1987.
2. ALL BANDS, ALL MODES — for contacts made via OSCAR-10, an individual station may be contacted more than once, but there must be 24 hours minimum between QSOs.
3. CONDITIONS —

a) Stations must make ***one QSO*** with the club station, FK25A

b) OR make ***three QSOs*** with stations using the FK25 prefix

c) OR have QSOs with ***five stations*** during the above-mentioned period, using any of the following prefixes: FK8; FK1; or FK0.

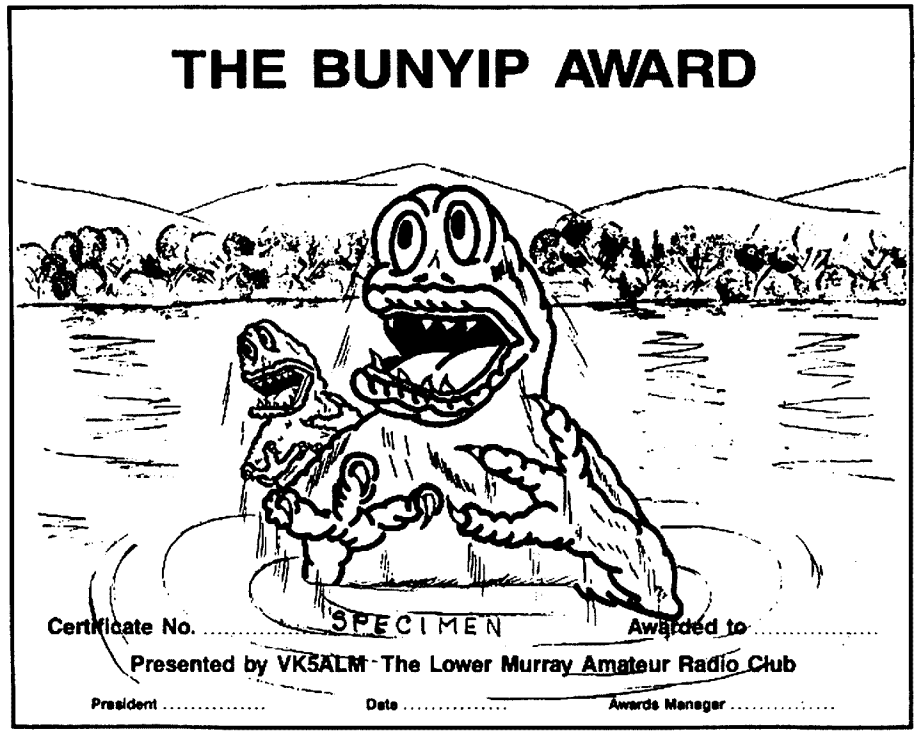
4. OSL CARDS NOT REQUIRED — a log extract certified by a radio club or two licensed amateurs.
5. AWARD PRICE — the award costs five IRCs or US$2 for surface mail or eight IRCs or US$3 for air mail.
6. ADDRESS — applications should be sent to: FK25A Award Manager, PO Box 3956, Noumea, New Caledonia, South Pacific.

DIPLOME DU GABON

DDG1 — Confirmed QSOs with eight different TR stations, any mode, any band.
DDG2 — Confirmed QSOs with 12 different TR stations, any mode on at least three HF bands.
DDG Special — One confirmed QSO on each of five different HF bands with at least two bands out of the three lower HF bands.

Minimum report of 33 or 339 will be accepted.

Send GCR list of confirmed QSOs certified by two other amateurs or an official from the applicants national association and 10 IRCs to: AGRA Diplom Manager, BP 1826, Libreville, Gabon.



THE BUNYIP AWARD

The *Bunyip Award* is presented by the Lower Murray Amateur Radio Club.

The requirements to obtain the award are as follows:

Australian stations are to work the Club Station VK5ALM, and five club members or seven club members.

DX stations are to work VK5ALM and two club members or four club members.

Shortwave Listeners may also apply for the award.

Log to be set out with Date; Frequency; Call Sign; Name; Location.

Cost of the award is $A2 plus a 50 cent stamp.

Applications to be sent to: Awards Manager LMARC, PO Box 234, Murray Bridge, SA. 5253.

CLUB MEMBERS — VK5s ABW; AHK; AKC; BRS; JP; NRB; NSI; PAN; PGH; UY; YU.

VANUATU AMATEUR RADIO SOCIETY AWARD

This award is a standard size certificate printed in the four colours of the Vanuatu flag and containing a scale map of the archipelago.

1. The award is offered to all licensed amateur radio operators who qualify.
2. To obtain this award, the amateur operator must have made not less than six contacts with Vanuatu stations carrying the YJ8 call sign who are members of the Vanuatu Amateur Radio Society. Contacts made from Vanuatu Independence Day, July 30, 1980 are acceptable.
3. Contacts may be made by CW, SSB, or RTTY.
4. Two contacts with any one YJ8 station will be accepted providing these contacts are made on different days, different bands or by different modes.
5. A log extract from the applicant showing the contacts claimed and certified by the signatures of two other licensed amateurs will be accepted. This record will be checked with the logs of the YJ8 stations worked.
6. Endorsements for all one mode, all one band or additional stations worked are available.

Cost of the award is US$2 or equivalent or 10 IRCs.

All inquiries and submissions should be addressed to: Awards Manager, VARS, PO Box 665, Port Vila, Vanuatu.

HAITI FLAG DAY DX PARTY

This event was held from 0000 UTC, May 18 to 2400 UTC, May 18, 1986 with the co-operation of all Haiti amateur radio operators. For the event, Haitian stations used the prefix 4V.

The purpose of the exercise was to introduce the Haitian Flag and to promote two-way contacts between Haitian amateurs and the rest of the world.

QSL cards and Flags Certificates will be awarded to stations who have contacted 10 Haitian stations using the prefix 4V.

QSLing via the bureau is essential with an IRC if possible.

Inquiries to PO Box 1484, Port au Prince, Haiti, WI.

WIA 75 AWARD

Hasmo Soejono YC2ERJ, Certificate No 664.

DARC DX AWARDS

General Rules — These diplomas can be obtained by licensed radio amateurs and SWLs world-wide. All contacts must be made from the same country.

Awards for club stations will be issued to the club and not to an individual operator. The DARC DX Awards are based on the European Country List and the ARRL DXCC List. All amateur bands, for which the applicant holds a valid license may be used. A set application form for the DARC DX Awards is available for three IRCs at the address below. The use of these official forms is obligatory.

QSL cards for all contacts claimed must be submitted with the application. Any altering or forging will result in disqualification. The service charge is 10 IRCs, 10.- DM or US$5 per award. The cost for each endorsement is five IRCs, 5.- DM or US$3.

All applications to DARC DX Awards, Walter Geyrhalter DL3RK, PO Box 1328, D-8950

Kaufbeuren, West Germany.

New award holders will be published in *CQ-DL* the club magazine of DARC.

European Countries List — C31, CT1, CT2, DL, EA, EA6, EI, F, FC, G, GD, GI, GJ, GM, GM Shetland, GU, GW, HA, HB, HB0, HV, I, IS, IT, JW Bear, JW Spitsbergen, JX, LA, LX, LZ, OE, OH, OH0, OJ0, OK, ON, OY, OZ, PA, SM, SP, SV, SV5 Rhodes, SV9 Crete, SV Athos, T77/M1, TA European Part, TF, UA 1346, UA2, UA Franz Josef Land, UB, UC, UN/UK1N, UO, UP, UQ, UR, Y22-99/DM, YO, YU, ZA, ZB2, 1A0, 3A, 4U1 Geneva, 4U1 Vienna, 9H1.

WAE (Worked All Europe)

A certificate awarded to amateur radio stations for contacts with European countries on different bands.

The WAE is issued in two divisions — Telegraphy (two x CW) and Telephony (two x SSB/AM/FM). Each European country counts one point on each band. For stations outside Europe contacts on 80 and 160 metres count two points. Maximum five bands per country can be used.

Classes

WAE III at least 40 countries and 100 points.
WAE II at least 50 countries and 150 points.
WAE I at least 55 countries and 175 points.
(Holders of WAE I get a special WAE badge).

EU-DX-D (Europa-DX Diplom)

The EU-DX-D is an award that may be claimed annually. It is issued in the following classifications — Telegraphy; 2 x SSB; mixed modes. For the mixed class at least 30 percent of the contacts must be made in a different mode.

A minimum of 50 points is required for the EU-DX-D per year. 20 points must be obtained by contacts with European countries and 30 points by contacts with countries outside Europe. All bands can be used. Each country counts one point, on 80 and 160 metres two points. Stickers are available for each additional block of four European and six non-European points within the same calendar year.

The EU-DX-D may be claimed every year anew. Each year's score may be added to obtain the EU-DX-D 500 badge and the EU-DX-D 1000 trophy. There is no limit to the number of years.

Europa Diplom

The Europa Diplom is awarded for working/hearing amateurs in European countries. Applicants must prove a total score of at least 100 points.

Annual Score — each confirmed European country counts one point per year on each amateur band.

Total Score — Sum of the annual score for the year of application and the five preceding years. There is no devaluation.

Europa Diplom Honour Roll

Each certificate holder with an actual score of at least 300 points will be listed in the Europa Diplom Honour Roll.

The Honour Roll will be published twice a year in *CQ-DL*, the club magazine of the DARC.

To improve the score QSL cards may be turned in twice a year. Make sure that the award manager receives them before June 30 or December 31 of each year to be considered in the subsequent publication.

Europa 300 Trophy

Holders of the Europa Diplom may obtain the Europa 300 Trophy. Applicants have to prove 300 country points when counting each country on each band only once in all the years. Servicing charge is 20.- DM or US$10 for the trophy when applied together with the Europa Diplom.

(Please note these rules were revised on January 1, 1984).

WEIC (Worked EI Counties) AWARD

The Committee of the Irish Radio Transmitters Society, have pleasure in presenting the WEIC Award, the first award to be sponsored by the IRTS. The award may be claimed by licenced amateurs and SWLs world-wide, who have worked/heard different counties of Ireland.

In accordance with IARU Region 1 rules, a claim for the award must be accompanied by a OSO list and by a statement from the applicants national DX-Awards Manager that states that correctly filled in QSL cards are in the possession of the applicant. If this is not possible, the applicant must submit all QSLs concerned.

Contacts on or after January 1, 1982 only are valid.

Cost of the award is 10 IRCs.

There will be no band or mode endorsements.

It is necessary to work/hear at least 20 of the 26 counties of Ireland (EI/EJ). Counties are: Carlow; Cavan; Clare; Cork; Donegal; Dublin; Galway; Kerry; Kildare; Kilkenny; Laois; Leitrim; Limerick; Longford; Louth; Mayo; Meath; Monaghan; Offaly; Roscommon; Sligo; Tipperary; Waterford; Westmeath; Wexford and Wicklow.

Applications should be sent to the Irish Radio Transmitters Society, PO Box 462, Dublin 9.

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HALLEY'S COMET AGAIN

Further to the sightings by people who saw Halley's in 1910, see page 11, June AR, I have received three more reports.

The first comes from Eric VK2NWV, who writes "... I saw Halley's Comet in daytime during 1910 from the corner of Burlington Street and Alexandra Lane, Crows Nest, NSW with the naked eye at approximately 30 degrees above the horizon in the southern sky. I was born in 1899 and remember the coma and tail was a golden colour.

"I also viewed it on March 12, this year with the aid of binoculars at 5 am, after waiting for a break in the clouds, a little south of due-east. It was greyish white in colour with the tail pointing upwards. The tail was much shorter and splayed more than on its 1910 visit and it was not visible to the naked eye.

"I had discussed it with my next door neighbour, Mrs Fleishman prior to its visit this time ..."

Mrs Fleishman's account is as follows "... Regarding Halley's Comet — I was 10 years of age and remember it in May or June of 1910. It was early morning, very cold and frosty, a clear sky and the Comet was clearly visible to tne naked eye. At the time I was living at O'Connell, a small village about half way between Bathurst and Oberon in NSW.

"The Comet's coma was in the southern sky and was a clear bright ball with a fan like tail that appeared to be moving in an easterly direction ..."

The third letter is from Eric VK4XN, "... If I delay any longer penning this letter, the Comet will be on its way back!

"All through the years I've had a memory of my father taking me out of bed one night in 1910, and pointing out to me this bright object spread out across half the sky. This occurred at Ravenswood, an old gold mining town in North Queensland when I was about four and a half years of age.

"According to some reports in the local paper, I wonder if some of the sightings in that period were factual or had some of the people actually seen it. One lady described it 'flashing across the sky like a meteor.'

"Even though I have an eyesight problem, glaucoma, I did get a good look at it the second time around, but what a disappointment for a lot of folks ..."

Well, thank you all for your interest in putting pen to paper, to allow it to be documented, so amateurs may compare it the next time it appears.

Contributed by Ken McLachlan VK3AH

VE7EXPO AMATEUR RADIO SOCIETY

The amateur radio station exhibit at Expo 86 reflects amateur radio's unique role in providing emergency and public service communications and also demonstrates recent amateur contributions to progress in communications.

The station features many state-of-the-art technical innovations pioneered by amateur operators, including amateur satellite, amateur television, and packet data communications. More traditional modes of communications such as Morse code, voice and RTTY will demonstrate the station's theme *Communications for Everyone*.

The station operates from 160 metres to 1.2 GHz daily from 1700 UTC to 0500 UTC the following day until October 13, 1986. CW frequencies are 3.510 or 3.710; 7.010 or 7.110; 10.105 or 10.120; 14.010 or 14.030; 21.010 or 21.110; 28.010 or 28.110 MHz. SSB: 3.740 or 3.795; 7.080 or 7.155; 14.135 or 14.205; 21.135 or 21.205; 28.135 or 28.305 MHz. RTTY: 3.590; 7.040; 10.140; 14.090; 21.090; 28.090 MHz. SSTV: 3.845; 7.171; 14.230; 21.340; 28.680 MHz.

VE7EXPO will QSL each logged QSO via national QSL Bureaus.

Further information can be obtained from Larry Reid VE7LR, VE7EXPO Operations Committee Chairman, 6615 Napier Street, Burnaby, BC, Canada. V5B 2C2.

Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

As I was recently listening on the 41 metre broadcasting allocation to some international stations, I became aware of the distinctive propagational changes to signals from Europe. Around mid-winter, as I am writing this, we have excellent propagation during daylight hours, yet it is poor during the hours of darkness.

This is not surprising if you refer to the *Great Circle Map* in a previous Call Book; Long Path signals from Europe traverse across the southern end of South America. As the sun rises in Europe, one can readily follow the propagation pattern. Signals start to deteriorate, firstly in eastern Europe, going out at 0500 UTC. The further west you go, signal levels are okay until their local sunrise.

United Kingdom signals usually disappear around 0700 UTC. By now, conditions have significantly altered, as we approach our spring, and Europe their autumn. Yet, at the time as I collate these notes, the pattern is quite marked.

SOME SIGNALS UP IN LEVEL

As signals from Europe and the Americas sharply decline at our local sunset, coincidently Asian and North Pacific signals have come up in level. For example, the Indonesian provincial station located in Irian Jaya, which is not normally heard when European signals are on either 9.615 or 9.610 MHz, is easily heard around 0730 UTC. It varies in frequency, hovering about 9.612 MHz and is usually in Bahasa Indonesian, although indigenous languages/dialects have been heard. These are understood across the border in Papua-Nuigini.

Not surprisingly, stations from Japan, Korea, China, and the Asiatic USSR are commonly heard at consistent strength. One station not normally heard in this region, because Australia is not on their antenna pattern, is heard very well. It is *Radio KNLS,* in Anchor Point, Alaska, whose primary targets are the USSR and China.

Listen on 11.860 MHz at 0800 UTC (11.850 at 0900 UTC), and you will hear their English language broadcasts. Programming is mainly musical, interspersed with religious "spot" announcements.

POSTPONEMENT

The projected date for *Radio NDXE* commencing to broadcast has been postponed. Originally scheduled for July 4, (see *Amateur Radio,* April 1986, page 53), the commencement date has now been re-scheduled for October 15. You may recollect that mention has been made in this column, of the station's proposal to transmit in AM-stereo. Delays in obtaining the specialised transmission system has caused the postponement. NDXE will be utilising the Kahn system, while the Motorola system, which is the one used here in Australia, has become the industry standard within the States. Kahn divides the two channels into the sidebands; eg left is on lower, while right is on upper. The Motorola format is mainly done with phase-difference.

There is a big question mark on the practicability of AM-stereo on shortwave at present. There are certainly no receivers with shortwave capability at this time. It is also questionable whether AM-stereo is workable with phase distortion, multi-path, plus the heavy congestion on the HF broadcasting allocations. Most consider the use of AM-stereo by NDXE as an advertising gimmick.

COMMERCIAL FORMAT

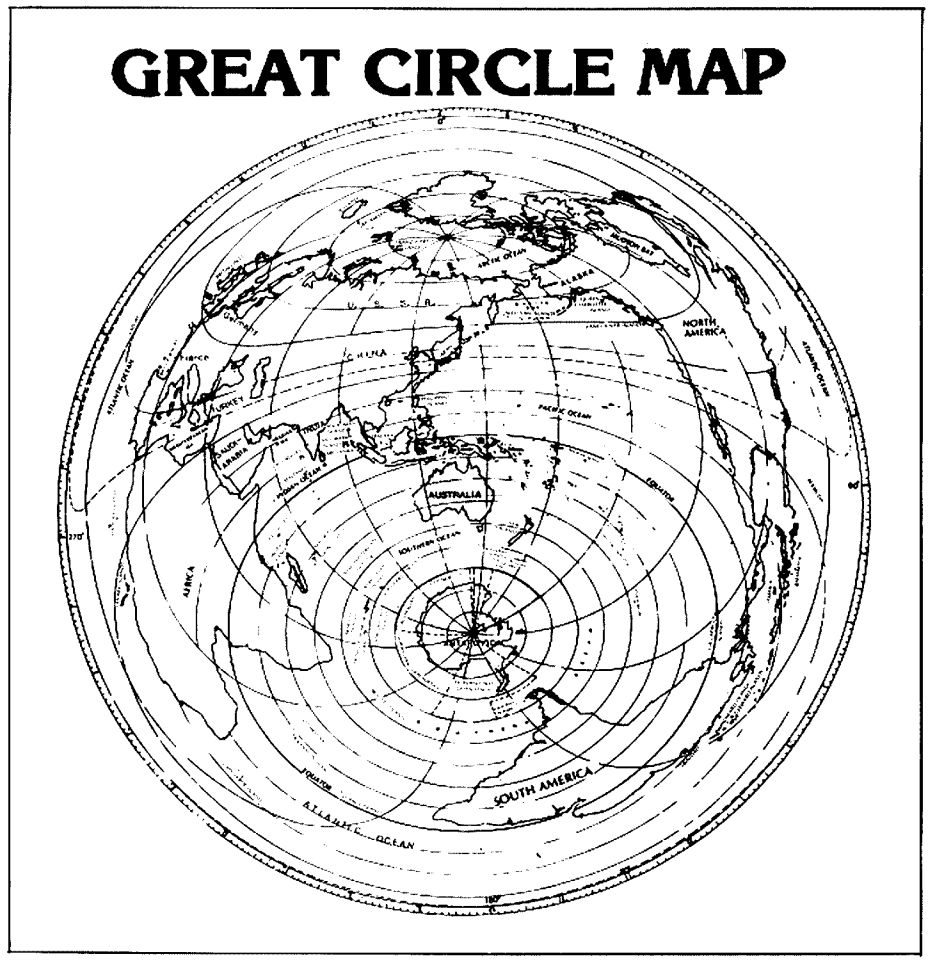
NDXE will be the third Stateside International Broadcaster airing a commercial format. WRNO, in New Orleans, was the first for a decade since the station, WNYW closed down in the 60s. Today, it mainly relays programming from its parent FM-station. Revenue from religious programming at weekends just keeps it afloat. The other station, KYOI in Saipan, is readily heard in Australia. It has a pop format and is operational 24-hours a day, in Japanese and English. It recently got into financial difficulties after the planned commercial sponsorship did not eventuate, appealing to its listeners to send in donations to keep it operational. It is still there, but for how long?

Commercial radio from a major broadcaster on shortwave does not appear to succeed. Will NDXE go the same way? Only time will tell. Incidentally, all the new private American shortwave stations mainly seem to have religious formats, the exception being NDXE.

IS IT ESPIONAGE?

Have you heard the "Numbers" stations around the HF bands? These, admittedly have been heard around for some time, ever since World War II in fact. Transmissions are usually on AM with someone reading out a stream of numerical groups. No identification is usually given. Languages vary, but Spanish and German are commonly heard. The consensus amongst the DX community is that they are engaged in espionage.

Operating across the entire HF spectrum at odd hours, these signals are usually heard on A3E or H3E (upper). Some maintain that they alternate the frequencies and operational times in a fairly predictable pattern. Recently, one of these stations popped up on our exclusive 20 metre allocation, 14.130 MHz at 1200 UTC. I could not readily identify the language, but surmise it was Arabic. Some DXers have done direction finding (DF) work on these signals, pin-pointing some of these to East Germany or Cuba, whilst others have been traced to the US and the Korean Peninsula (both north and south).



CHECK THESE FREQUENCIES

You may like to try these channels: 10.580 MHz at 0800 UTC, 6.975 at 0530, 5.250 at 0630, 13.766 at 1200 UTC, as well as keeping an eye on 14.130 MHz from time to time. The above channels are where the "numbers" stations have been previously monitored, yet they are liable to pop up anywhere at any time. Incidentally, the "number" groups are in a five-figure cipher, repeated twice. I have seen reference to enthusiasts who mainly concentrate on these sometimes elusive signals. I know that Bob Grove of Brasstown, Pennsylvania, is one well-known enthusiast.

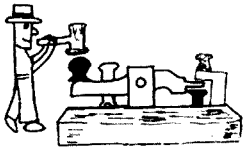
UNUSUAL!

Whilst we are on unusual stations, what is the station on 6.348 MHz, AM around 1000 UTC daily? Broadcasting in Korean, it has old Korean songs plus plenty of slogans. Identification is extremely difficult, but it is reportedly *Radio Echo of Hope* and located within South Korea.

The North Koreans have a well-known clandestine station on 4.119 MHz at 1200, also in Korean. Called *Voice of Re-Unification* the station has always claimed to be broadcasting from Seoul, which is in South Korea, yet monitors have heard cross-modulation from *Radio Pyongyang* in the north. It has an English program at 1400 UTC.

This clandestine warfare has been going on since the *Korean War.*

73 — Robin VK7RH



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

Since writing the column which appeared last month, I enjoyed a personal visit from Syd VK3ASC, and we had a long and pleasant chat about many things, including CW. And I received another interesting letter from Gordon VK1AD, much of which is worth repeating here . . .

"Firstly, let's clear up the matter of the telegraphic 'laugh' . . . my typewriter is one of these new-fangled electronic gadgets and has little or no sense of humour . . . the laugh was dah-dah-dah-dit . . . the dot on the end probably wasn't apparent. It was a signal that could be sent with considerable feeling (or lack of it), depending on the quality of the joke. For a really funny remark or joke or whatever, the signal would be sent with great feeling — length of the dashes exaggerated, and a short pause after each rendition of the signal — presumably for the operator to indulge in a real 'belly-laugh.' If the feeling was one of only slight amusement, the signal would be sent quickly and no pause for rolling in the aisles or anything, and then back to business.

"I am pretty sure that this signal and quite a few others (such as 73) came from the old 'American' code. Simple numerical codes were used similarly to today's Q-code. I faintly remember seeing recently some discussion on the use of 'D' to signal urgency . . . this is no doubt derived from the old signal '8' for urgent traffic used in the American code and, of course, in practice abbreviated to 'D'. There was a code used in the old days . . . '29' to indicate a message that could not be delivered for some reason, the clerk who looked after such matters was known in Australian Post Offices for many years as the '29 clerk.' The old American code was designed to save time, and even had many letters of the alphabet abbreviated; eg Y was dit-dit dit-dit, C was dit-dit dit, R was dit dit-dit, and so on. Apparently, the old-timers were too lazy to send many dashes!"

With reference to mechanical Morse, Gordon says ". . . it took many varied forms in this country. The type used was geared very closely to the traffic demand on a particular circuit. Manual Morse was used on lightly loaded circuits, where usually there were several stations concentrated — this was what was called a 'closed circuit' system. On more heavily loaded circuits, duplex working was used . . . this had two men at each end, one sending and one receiving simultaneously over one wire. (I still have a circuit diagram of this system, I think) . . . and then a system called 'Diplex' was used where one wire was used but traffic was more or less unidirectional — that is, two men sent simultaneously in the same direction over the one wire. There was even one system where two Diplexes were diplexed . . . that is four operators sending in the same direction simultaneously over one wire.

"The type of mechanical Morse you were familiar with as a lad (described to Gordon in a letter) was probably the old "Wheatstone System" — what a fertile imagination the man must have had. This was a system whereby a machine called a "gell" was used to punch up a tape in Morse in the following fashion:

"This was sent at around 80 to 100 words-per-minute if memory serves me correctly, and was reproduced at the other end in the same fashion — that is, on a punched tape. The punched tape was then fed into a 'reader,' a machine which transcribed the Morse characters as letters on a paper tape. Handling this paper tape was quite an art — one form was pre-gummed and ran over a roller picking up water from a trough beneath, one was plain tape which ran over a roller picking up gum from a trough — the beginner usually finished the day with hands, and shirt, and various other parts of the anatomy covered with icky sticky goo. However, with a little practice, a gummer could get through a staggering amount of work, and still leave most of the gum on the tape.

"There was also a system used by the NSW railways when I was learning Morse, around about 1940, which had a disc attached to the end of an armature actuated by a solenoid which rotated in an ink trough and marked the paper tape with signals in dots and dashes . . . when I was a lad (a Post Office Messenger), I used to confound the local lads at the railway station with my ability to read the audio signals straight from the sounder and have it done while they were still trying to read the dots and dashes transcribed on the paper tape. Ah! those were heady days."

I am sure all readers will join me in thanking Gordon for the entertaining information, and I hope there is more to come. I was particularly intrigued by the telegraphic laugh, which sounds a lot more flexible then "Hi." Come to think of it, I always did think "Hi' sounded more like a giggle than a laugh, and downright silly on phone.

On the subject of old-time land-line telegraphy, I have recently commenced an international correspondence with Tony Smith G4FAI, who is sort of an English 'opposite number' to yours truly. Tony writes a column titled *Morse Report* in *Amateur Radio* (not this one). He says there is a real resurgence of interest in CW in England, and cites an award as one of the factors — I think it might be worth borrowing the idea. It is simply a certificate awarded by the G-QRP Club to any Novice who submits an authenticated log showing 50 CW contacts. The award is in two classes, 'A' for QRP three watts output, or less, and 'B' for any legal power output. If you think the idea has merit, please drop me a line, so I may take it up with the Federal Awards Manager.

Getting back to old-time telegraphy, Tony published a fascinating article on the history of Morse in the February 1986 issue of *Practical Wireless*. We all know that the first words sent in Morse were "What has God wrought." But do you know the occasion, or who suggested them? Very interesting reading. Tony's particular interest at the moment is tracing the history of International Morse (ITU Standard Morse as we know it today).

73 till next month.

BEACON PLANNING

As previously mentioned in these notes (see page 57, July), FTAC is working on a Beacon Policy Paper this year.

Below is further background material on the operation of beacons.

The choice of frequency and method of operation varies, depending upon which part of the spectrum the system operates.

In recent times there has been an up-surge in HF systems, particularly on 10 metres. Originally, the International Band Plan had a common time-shared frequency of 28.200 MHz and single channels per system, extending down towards the lower band edge for about 50 kHz. It was subsequently found that, an administration had some licenses (by regulation) in the same sub-band. To overcome this problem, the Beacon Plan was hinged around 28.200 and extended upwards toward 28.300 MHz.

For some years, the development of 10 metre beacons continued with more than half (including Australia's) now being part of the International Beacon Project, co-ordinated from the United Kingdom. There are more than 80 beacons, most between 28.200 and 28.300 MHz, at either 2.5 or 2 kHz spacings. A few channels are shared by two systems.

To us 'down-under' in these times of low sunspots, 10 metres looks like wide open, un-inhabited spaces, but in other parts of the world, there is a lot of activity.

By way of history, the 10 metre (Australian) Novice sub-band was influenced by the beacon segment. First the Novices were to get a segment of 10, but the Department of Communications chose to place them *on* 11 metres instead. When 11 metres was withdrawn for the CBRS, the Department then offered 28.100 to 28.300 MHz as the replacement for Novices. This was discussed at a Federal Convention and it was requested that the 10 metre Novice sub-band be 28.100 to 28.600 MHz. This allowed space to avoid the beacons as well as give access to CW at the low end and American phone band above 28.500 (the American Band Plans are controlled by regulations). The Beacon portion, 28.300 to 28.500 allowed us to establish local operation, as well as fit a 23 channel, 11 metre converted unit into 28.300 and 28.600 MHz.

Elsewhere in the HF spectrum some other beacons have developed, noticeably the 14.100 MHz, time-shared project, co-ordinated from the West-Coast Americans. The system employs (up to), 10 stations at different world locations and each has its own one-minute transmission period, which repeats every 10 minutes.

During each beacon's transmission period the output power is reduced in steps of 10. Starting at 100 watts, it drops to 10, 1, .1 and so on. To provide meaningful results to the observer, each beacon has to have a similar antenna system. The time control has to be accurate for each to observe its allotted slot.

Currently the German amateurs have a beacon on 10 MHz. In world planning a spot frequency has been left at 21.150 MHz, but it is not known if it is being used. While not a beacon in the true sense, the continuous Morse transmission of VK2RCW is on 3.699 MHz.

At the Region 3 Conference, held in New Zealand last November, the spread of 10 metre systems was discussed and it was decided to change to a small group of time-shared channels. It is proposed that there would be a main frequency of a world selection, including one for Australia, possibly similar in concept to 20 metres. In addition, there would be additional channels for time-shared regional systems. The proposed sub-band extends around 28.190-28.200 MHz.

From Australia's view-point, we would have one beacon in the prime allocation. In addition, we would have several slots in one of the regional channels. The change over is to occur by January 1, 1990.

Australia currently has six frequencies (28.260-28.270 MHz) with systems at Townsville, Sydney, Adelaide, Albany and Perth. One is also being constructed for Darwin. For our systems to be included in the change they would need to be fitted with time controls with a repeat accuracy better than one second. Ideally they should have similar power output and antenna systems.

To be continued next month

Tim Mills VK2ZTM
Federal Beacon Co-ordinator

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Club Corner

MOUNT GAMBIER'S 22ND ANNUAL CONVENTION
June 7-8

Well! If you missed the Mount Gambier Convention this year, you certainly missed another good one.

Upon arriving on the Saturday, as did most interstate visitors, It was obvious that Mount Gambier had surely turned on beautiful weather.

The Convention was very well supported by local and interstate trade displays, with some new and well-known equipment available on the market today at bargain prices. The Component Group of the South Australian Division also created a lot of interest as did the Pre-loved White Elephant Tables.

The Trade Displays certainly proved popular with visitors to the Convention.

The activities were too numerous to mention, but by the excellent participation in the Fox and Sniffer Hunts on the Sunday, it was surely one way of keeping out of the cold weather.

Antennas to the ready for the Fox Hunt.

A barbecue lunch was served and was well accepted by all in attendance.

Particularly impressive was that there was plenty of activities all day and yet there was still time to take a drive around some of the tourist sights.

VK3DIP's equipment in readiness for Fox Hunting.

Paul VK3DIP, prepares for the Fox Hunt.

Presentations were held at the end of the day to the various winners of the events held over the weekend.

Winner of the Home-brew Section, with a beautiful piece of workmanship moulded into a Cavity Filter, was Brian VK3AFN.

The Perpetual Trophy, over the course of the weekend, went to Richard VK7CG, who thanked the committee for an excellent program of events.

At the close of the day, an extremely enjoyable smorgasboard tea was served. A very special thanks is extended to all the ladies and their helpers, who spent most of the week and the weekend preparing for, and serving the hungary gathering.

To the SERG Committee, a very warm thank you from one very happy visitor on behalf of fellow amateurs, families and friends for a very enjoyable and well organised convention. And a special thanks to VK5EE and VK5OA for their hospitality.

If you did not attend the 22nd SERG Convention in Mount Gambier, promise yourself a treat next

Participants in the two-metre Sniffer Hunt. The eventual winner was VK7CG.

Richard VK7CG, winner of the Perpetual Trophy, accepts the Trophy from VK3VT, last years winner.

From left: Kevin VK5OA, Woody VK3AGD and John VK3XS in VK5OA's shack.

Some of the members and family of the North East Radio Group, VK3.

year and make sure you attend the 23rd Annual SERG Convention next year. You certainly will not regret it.

Photographs and story contributed by David McAulay VK3EW

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COMMUNICATION DAY 1986

The Shepparton and District Amateur Radio Club is holding its Communications Day on Sunday, September 7, 1986. The event was previously held In 1983 and 1984 and proved popular with amateurs throughout Victoria and southern New South Wales.

This year there will be demonstrations of the latest equipment and radio techniques. On display there will be a home-type AUSSAT receiver station, which will probably be the first time many amateurs have seen the picture quality from Australia's own satellite.

Early indications are that there will be a very large range of new equipment on display whilst disposals type gear will also be available, along with a range of components.

Demonstrations of packet radio, hopefully on HF as well as VHF, RTTY and a comprehensive demonstration station will give plenty to see and talk about.

The Club will also be launching the *Wombat Award*. This is the Club's first entry into this field and the numbered awards will be eagerly sought.

The venue will be the Shepparton Showgrounds, and tea and coffee will flow all day. Also lunch will be available.

Further information may be obtained from Peter O'Keefe VK3YF, PO Box 692, Shepparton, Vic. 3630 or phone (058) 21 6070.

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NORTH EAST ZONE

Fifteen members attended the meeting of the Zone held at the Wangaratta TAFE College (thanks to Dave) on Sunday June 1. Also in attendance were two prospective members and a special guest, Barry VK3XV, on behalf of the Divisional Council.

Many thanks to Barry for the news of the latest WIA happenings and for a very lively discussion.

The main interest was in the new Porepunkah repeater, and the links to Wodonga and Corryong. The Zone is now expecting some action in the near future and with luck and a bit of work, Porepunkah may be ready and running In time for the ski season visitors.

One solar panel has been purchased, and the two mounts are presently in Shepparton being galvanised.

The nine dB antenna for VK3RNE has arrived and as soon as the new mounts are sorted out, and a sky-hook arranged, there will be a working-bee to get it installed. Many thanks to VK3s AQU, DUB and ZR for their donations for the solar panels.

The Sunday Broadcast proposals were met with genuine approval as reception has been poor in the past. Seymour on 80 metres should improve matters considerably.

Discussion took place on the new packet repeater located in the Albury area. Thanks to the dedication of about five members, commencement of operation should not be too far off.

Also discussed was the matter of equipment disposals, and it was suggested that an insert in *Amateur Radio* be provided to be sent in by members who wish to compete in a ballot for any goodies. The country members who used this system in the past all claim that it was much fairer.

The next meeting of the Zone will be advertised on the Sunday Morning Broadcasts and in *Amateur Radio*. Everyone is welcome.

Contributed by Gil Griffith VK3CGG, Publicity Officer for the NE Zone

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GEELONG AMATEUR RADIO CLUB

The Annual General Meeting of the Geelong Amateur Radio Club was held on April 18, with the following office-bearers being elected:

President: Alf Forster VK3AJF
Secretary: Barry Abley VK3YXK
Treasurer: Carlo Leone VK3BCL
General Committee: Mike Trickett VK3ASQ and Albert Gnaccarini VK3ZZX
Public Officer: Carlo Leone VK3BCL
Repeater Sub-Committee: Chas Gnaccarini VK3BRZ and Peter James VK3AWY

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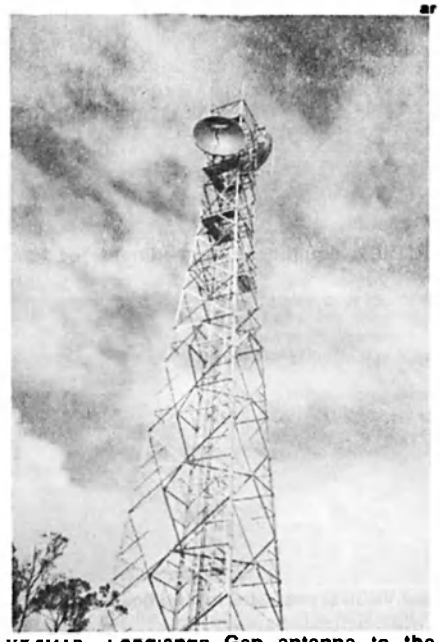


VK4RTA, Longlands Gap antenna to the right of the dish.

Photograph courtesy Anne Benson VK4FAB

"SHE'S A BEAUT AGAIN, MATE!"

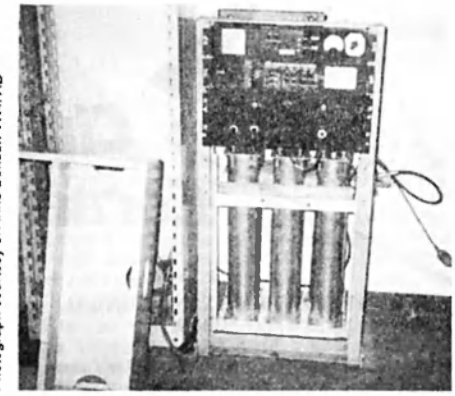
Far north Queensland's latest two-metre repeater, VK4RTA, was commissioned on Sunday, May 25, by the President of the Cairns Amateur Radio Club, Colin Swinburn VK4EX.

The Cairns Club's second repeater is located on the southern end of the Atherton Tableland, between Herberton and Ravenshoe and at an altitude of 3850 feet (1175 m) above sea level. It is Queensland's second highest repeater after VK4RCA which is 5250 feet (1600 m) ASL on Mount Bellenden Ker.

Tourists visiting this scenic wonderland can be assured of excellent VHF communications whilst mobile since coverage is also provided by VK4RCA.

The main purpose of VK4RTA is to cover parts of the area not serviced by VK4RCA, but more importantly, to provide communications as far west as possible on the lonely Kennedy Highway and out into the Gulf Country.

VK4RTA is located at a Telecom broad-band microwave repeater station, at Longlands Gap,



Photograph courtesy of Anne Benson VK4FAB

The repeater rack of VK4RTA.

which is one of a series being installed to push modern communications to the outback. This station with its 165 feet (50m) tower receives signals from Mount Bellenden Ker on 6 GHz and re-transmits them to Mount Garnet, thence on to Mount Surprise, Georgetown and beyond.

There are 1800 channels available for telephones, telex, data and television.

The two-metre repeater equipment is the original history making VK4RCA rig which has been overhauled and modified. Its transmit frequency is 146.675 MHz and it receives 146.075 MHz with a time-out of four minutes. The effective radiated power at present is 10 watts and the antenna is a vertical collinear with a 3 dB gain.

Thanks to the efforts of Wilf VK4ZNZ, Dale VK4KDM, Graham VK4FGB, plus other club members, far-northern amateurs have another VHF link which also provides a valuable back-up for VK4RCA in times of emergency.

From left: Dale VK4KDM, Wilf VK4ZNZ and Colin VK4EX, Club President.

Photograph courtesy Ted Gabriel VK4YG

VK4RTA has been accessed from Hughenden by Max VK4BMW and John VK4FNQ/P under inversion conditions.

A Service Area Map of both repeaters, VK4s RTA and RCA, will be compiled, so reports, either direct on the Queensland Net, Thursday evenings at 0930 UTC on 3.605 MHz, or by mail, would be greatly appreciated. (Please state location, type of antenna and power).

Location Co-ordinates — VK4RTA: Latitude 17 degrees 30 minutes south. Longitude 145 degrees 28 minutes east.

Club members celebrate the Commissioning of VK4RTA.

Photograph courtesy Ted Gabriel VK4YG

Location is on the Kennedy Highway, near Evelyn Central and the Crater National Park.

ERP at present is 10 watts.

Licensee: Tablelands Repeater Group, Cairns ARC.

Contributed by Ted Gabriel VK4YG

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DISABLED PERSON'S RADIO CLUB

The VK4 Disabled Person's Radio Club, VK4BTB, was officially opened in Toowoomba by Senator Gerry Jones, representing the Federal Minister for Communications, the Honorable Michael Duffy, on the August 24, 1983

To celebrate the Club's third anniversary, an 'on-air' day will be held at Roley Norgaard's QTH on Sunday, August 31, 1986.

The 'on-air' activities will commence at 0001 UTC and cease at 0700 UTC. Should there be operators available, these hours will be extended.

The frequencies on which the Club proposes to operate on SSB are as follows:
3.590; 7.090; 14.190; 21.190 MHz.

Modes used will be dictated by availability and expertise of operators, but it is hoped SSB, CW and RTTY will all be used.

Further inquiries can be made by contacting the Club on their regular Friday Net, which commences at 0900 UTC on 3.590 MHz ± QRM, or by contacting Roley VK4AOR, on (076) 96 7587 or Graeme VK4NYE on (076) 30 8323. Both are QTHR.

The Club is looking forward to meeting you on this day.

Contributed by Roley Norgaard VK4AOR, Station Manager for VK4BTB

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DEVIL NEWS from the North West

There is not a lot of news to report from the Branch this month as the meeting was reduced to urgent matters only so that the ladies would not have to wait around too long.

The six ladies present and the guest speaker and his wife were welcomed by Rob VK7KAB. It was also announced to the 16 members present that VK7RAD was operational from VK7ZAP's QTH, and attention was drawn to the recently completed Diplexer, which was on display for members to see before it was put into operation.

Darryl Odgers was welcomed as a new member.

The rest of the evening was spent learning about *Camp Quality* with the assistance of a short video and a talk from John Willet. John explained the facts and requirements of the camp. The camp is from December 8 to 14 and during that time, those involved will have their entire day and some of their evening fully occupied. This fact must be understood by volunteers and their families before they commit themselves.

The men will be involved in communications for the camp and a station for contacts with other children for the camp children to talk to. Others will be involved in the activities side of things as well as a Video.

As the date draws nearer, donations of cakes and biscuits may be asked for as the whole project is public funded and every cent is most important.

A pleasant get-together and supper followed to complete the evening.

The new club room is progressing quite well and some planned benches are now built and in place. (It was decided at the meeting to reimburse Greg VK7ZBT, for the cost of the timber which he had bought with his own funds). Thanks also to Greg for getting these notes together!

There was a Saturday Working Bee recently which resulted in the antennas being shifted and the coaxial cable being re-located into the room. Nine willing pairs of hands made the Bee a great success.

There may be a need for more Working Bees in the near future to continue with the project — Greg will no doubt let all members know when and why.

Contributed by Max Hardstaff VK7KY

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DALBY AND DISTRICT AMATEUR RADIO CLUB

The Dalby and District Amateur Radio Club, although small in size, is very enthusiastic in it's activities. The largest achievement of the Club has been to successfully establish a UHF repeater which is situated on Mount Mowbullan, in the Bunya Mountains north-east of Dalby.

The repeater consists of an old commercial UHF transceiver which has been converted to the appropriate frequency.

Apart from the transceiver, all other associated pieces of equipment have been home-brewed. Consequently, the project has been a very reasonably priced one compared to many others of similar ilk. The total cost to the Club was around $300, including a $100 on-site public risk insurance. This was only possible through the generosity of several amateurs who contributed various components, time and physical effort to the project, especially Tom VK4NO, for the construction of the identification and control unit, and to Mike VK4XT, whose many hours of dedication made it all possible.

The Club is very active in WICEN and takes an active part in several exercises each year in conjunction with motor-cycling enduros, car rallies, off road car races, road runner marathons, etc. Experience in this area has proved that 80 metres, 3.5 MHz, is the most reliable frequency for these operations as it penetrates through most types of terrain, unlike the higher frequencies which fail in many situations.

The main problem encountered with 80 metres is the size of the antenna system needed. Consequently, the Dalby Club is experimenting with different types of portable antennas for 80 with varying degrees of success.

Contributed by Neil Holmes VK4NF, Club President

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A R Showcase

HARD DISKS ARE TOO RELIABLE! ! !

Users are taking huge risks with valuable data — an odd statement from one of the hard disk industry's gurus, Max Pietruschka, but as Marketing Manager for Daneva Australia, a leading distributor of mass storage devices, Max should know what he is talking about.

"The hard disk drive has become so reliable that users forget that it is even there and then POW! ! ! right out of nowhere a power glitch, a heavy handed user or an employee with an axe to grind erases a year's worth of data".

Max has seen the cost of hard disk drives drop to the point that the average Personal Computer is not complete without one, and users no longer equate the value of their stored data with the value of the storage device.

"What price do you put on 20 MByte of data? I'm not only talking about the re-entry man hours, some data is just not recoverable."

Max sees an urgent necessity for education of the PC fraternity so that they really understand the limitations of hard disk integrity and take the necessary precautions to ensure their data's protection.

Daneva offers at least seven unique solutions to the backup and security problem. Using *Fastback*, a floppy based archiving system, a PC user can backup 10 MBytes in eight minutes. On an AT, 20 MBytes can be laid down in the same time.

Removable hard disk media, is an excellent method of having a hard disk and storing it too — there are about three standards of tape drive with the data cartridge being the most popular.

With a *PortaFile* it is possible to keep a mirror of the PC's hard disk.

The ultimate backup for high performance hard disks of 70 MBytes or more is the laser disk.

For further information contact Daneva Australia Pty Ltd, 64-66 Bay Road, Sandringham, Vic. 3191 or phone (03) 598 5622.

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THOUGHT FOR THE MONTH

People who don't change their minds are either perfect or stubborn.

* * *

Transceiver: *"Did Dracula like computers?"*
Micro-computer: *"Yes! It was love at first Byte."*

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER

56 Baden Powell Drive, Frankston. Vic. 3199

The statement was made to me recently that, although my position is called Education Co-ordinator, the job I am doing is that of Examination Co-ordinator, as it has payed little attention to methods of educating the general public about matters relating to amateur radio.

I can agree with this statement to some extent, but offer no apology for putting most of my efforts and available time into examination related matters. I am sure most readers would agree that support and assistance for the new recruits is probably the most effective way of ensuring the future of our hobby and the Institute.

Several recent articles have suggested ways of increasing the number of active operators.

The value of these articles has lain less in the actual proposals than in the amount of thought, discussion and argument generated by them. Some of the proposals have been directed at particular target groups; eg the young, or the computer enthusiasts. Less consideration has been given to publicising the hobby amongst the general population, which may well be the easiest and most effective way of maintaining and increasing our numbers.

Our hobby does not have a "high profile." Most people see us as CBers who have unsightly towers and cause television interference. We do not generally attract much media attention. When I changed schools at the start of last year, I moved into a population where only about five percent of the staff seemed to have heard of amateur radio. My suggestion of establishing a school radio station was interpreted as wanting to play records over the Public Address System at lunch-time. The idea of a two metre box in the car was greeted with disbelief. But I do not think this particular population is unique — it is probably quite average. Because so many of us work in fields related to our hobby, we tend to forget about the ignorance of the general public. Perhaps we should be actively educating them. There is a vast reservoir of potential recruits waiting to be tapped.

How do we go about it? We all probably spend some time in organised efforts — JOTA, Demonstration Stations, WICEN, etc where we have a captive audience, but more can be done.

Does your local newspaper accept and publish reports of your club activities or notices of meetings?

Does your local electronics shop have a notice-board where meeting dates could be displayed?

Does you business bring you into contact with schools or other institutions where leaflets or copies of AR could be left?

Does your library or community centre have a board for notices of local activities?

Do you explain to the staring teenager why your car has three antennas on it?

Do you offer assistance to the struggling students?

Do you bring the hobby into your conversations with non-amateurs occasionally?

There are endless possibilities. I am not demanding that all members rush out and start preaching, but if we wish to retain our privileges and the strength of the Institute to speak up for us, surely we can each make some effort towards encouraging potential operators, or persuading current non- members to join the Institute.

73, Brenda VK3KT

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VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

AMATEUR RADIO HOUSE

Is located at 109 Wigram Street, Parramatta. It is open from 11 am to 2 pm Monday to Friday and from 7 to 9 pm Wednesday evenings. Telephone (02) 689 2417 during these times.

REMEMBRANCE DAY CONTEST

See July *Amateur Radio* for rule details. For the past two years, VK2 has been the winning Division. Can we make it a third time? I am sure that we can if as many VK2s as possible set aside some time during the weekend of August 16 and 17, to have as many contacts as possible. Follow this by the all important submission of the log. The RD opening address will be transmitted before the 6 pm start and VK2WI will commence at 5.30 pm with the weekly news bulletin followed by the opening address. There will not be the transmission at 11 am on Sunday, 17th, but the evening session at 7.30 pm will be as usual.

SEMINAR AND DINNER

It has been decided to hold the next VK2 Seminar at Amateur Radio House on Saturday, September 13, and a Dinner on Saturday evening, October 11.

Members are reminded of the monthly barbeque at Dural on the first Sunday of the month — August 3 and September 7.

The Fireworks evening was held in ideal weather on May 31, with an attendance of over 100. Next year's event will be held on the Saturday evening before the June long weekend.

160 METRE BROADCAST

The frequency for this broadcast is to change. The present frequency of 1.825 MHz now falls within the Band Plan DX-Window. It has been decided by Council to change, particularly with our evening transmission. The chosen frequency is 1.845 MHz. The old frequency will be retained in the transmitter as an alternative channel, should the need arise. The VK2RSY. Beacons at Dural, will expand into the higher microwave regions.

The next systems will be on the test frequencies of 10.300 GHz and 24.100 GHz (subject to licensing approval). The Division is to develop a multi-mode packet repeater for installation at VK2WI. This will be followed by a Bulletin Board facility.

CENTRAL COAST ARC

The Central Coast Amateur Radio Club is to develop a packet repeater on two metres and an ATV repeater. (Input ATV1 on 70 and output at 50 cm). They conducted further tests on May 25, to site-check a proposed two metre WICEN site, west of Cessnock.

In late May, the Tamworth two metre repeater, VK2RTM 6750, was vandalised and much of the equipment damaged.

The investigation for an alternative channel for the Liverpool and District repeater, VK2RLD continues. The need to change is caused by the recent location of a pager transmitter 200 metres away, 37.500 kHz from its present input.

MOSQUITO RESTORATION

There has been a good response with equipment offers for this project. Perhaps it is time to also start rounding-up some of the old WWII equipment which is still around in original or mint condition. While display and storage presents a problem in many cases, it will not be long before much is lost for all time and the various museums will be seeking it. Any thoughts on how best to preserve equipment of yester-years?

REMEMBER?

A reminder to all Clubs. The next *Conference of Clubs* will be held on Sunday, November 2. The closing of the agenda is mid- September, so any items should be raised this month at your meetings and submitted without delay to the Divisional Office.

Also, at the time these notes were being prepared, there had been a poor response from Clubs for the details and questionnaire regarding insurance.

FIELD DAY

The Oxley Region Field Day was held at Port Macquarie over the June long weekend, in ideal weather conditions. Registrations exceeded 150. The next country field day will be the South West Zone, which will be held in the Riverina during October. Details later.

WICEN

Coming activities for WICEN include the *City to Surf* in Sydney, on Sunday morning, August 10. The Car Rally at Batemans Bay will be held on the weekend of August 26-28, and the Canoe Classic on the Hawkesbury over the weekend October 18-19. Registrations to attend may be given on the weekly VHF Sydney nets — Thursday at 8.30 pm or telephone the Divisional Office at the times and number above.

Steve Boyd VK2DNN, is the Acting-WICEN Co-ordinator. The VHF 7150 repeater transmitter is currently being re-built.

JOTA

This will be held over the weekend October 18-19. Now is the time to contact your local group. If you have no regular group, but would like to offer, then register with the Office.

DISPOSALS LIST

A new list is available from the Office by sending a SAE. There has not been much change to items available from the May list, however. Publications stocks are also low at the moment. A range of most sizes of the tee-shirts, leisure shirts and wind-cheaters are still available.

NEW MEMBERS

The VK2 Division of the WIA welcomes the following new members.

B Baolgh VK2BBX, Liverpool; J M Brest VK2PJB, French's Forest; A G Brodie VK2BYA, Junee; D S Brown VK2JAG, West Pymble; R A D Clark VK2JJN, Winmalee; L E Cooke Assoc, Stockton; D Dauner VK2EDD, Bankstown; R J Foster Assoc, Hornsby; R J Gifford-Moore VK2XEU, Artarmon; R S Harris Assoc, Hay.

F G Izon VK2DQX, Farmborough Heights; F J Manthey VK2MKT, Birmingham Gardens; S Murdoch VK2TIE, Wyee; I L Norman VK2ZIN, New Lambton; M E O'Ryan Assoc, Concord; G R Parsons VK2DUR Sanctuary Point; C J Proud Assoc, Fairfield West; P J Sturt VK2ZRT, New Lambton Heights; W Thompson Assoc, Cessnock; J E Welldon Assoc, Cessnock.

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Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Starting off with the unpleasant news of how the amateur bands were disrupted in April, we have the following statistics:

321 Am intruders; 162 CW intruders; 102 using RTTY; 48 other modes, and 73 intruder stations gave their call signs.

Probably there are those who will say, "Wait a minute — 73 stations gave their call signs? Well, if you know who they are, why don't you do something about it?" Why, indeed?

Unfortunately, it is not as simple as that. Knowing the call sign does not always tell us where they are, or who they are. Also, obviously, a great many of these stations ***are working with the blessing of their country's administrations!***

There is not much we can do about that, short of declaring war! However, we can continue to appeal to the various administrations, and hope that, sooner or later, their conscience gets the better of them. Meanwhile, thanks to those who sent in reports for April 1986; vis VK1NUN, VK2s COP, DEJ, DVW, EHQ, PS, SWL, G H A Bradford, VK3s LC, XB, VK4s AKX, AV, BG, BHJ, BTW, KAL, KHZ, VK5s BJF, GZ, VK6s JQ, OD, RO, XV, XZ, VK7RH, VK8s HA and JF

MORE TAXI CABS

The problem of the Asian activity on 28 MHz, allegedly coming from Hong Kong, appears to be building into a real problem. I received a letter from Phil VS6CT, who said that the taxi cabs in the colony were indeed using 28 MHz, and he supplied me with a cassette tape of these signals, copied locally. All are in Cantonese, of course. The Intruder Watch is working with the IARU International Monitoring System Co-ordinator on this matter, and I have sent a letter off to the DOC, to see whether they can let the Hong Kong authorities know that the chaos the cabs are causing is ***not*** internal to their borders, and when the solar cycle gets it's act together, there will no doubt be a lot of disgruntled 10 metre enthusiasts who will be finding that they have *called a cab!* (Which is okay if one is interested in seeing Hong Kong, but I warn you, the fare will be astronomical!).

COMPLAIN NOW!

Seriously, ***now*** is the time to start complaining, before the lower half of the band is full on ***non-amateur*** traffic. So, if you hear 'em — report 'em. TNX. (They are currently being heard up to 28.600 MHz). The people who operate the beacons in the 10 metre beacon segment should have an interest in keeping the frequencies clear.

NEW CO-ORDINATOR

Bill Wilson VK3DXE, has been appointed the new IW Co-ordinator for the Victorian Division of the WIA. Welcome to the club Bill, and we look forward to your input. Bill replaces Steve VK3JY, who has had to relinquish the post.

Still looking forward to the solar cycle Improving, but this will be a mixed blessing, with no doubt also an increase in intruder activity.

JAMMERS CAUSE PROBLEMS

Henry VK2ZHE, passed on some disturbing news in May — a medical emergency was taking place on a yacht off Papua New Guinea, and the amateurs who were handling the traffic had to try and battle through a jamming station, which, at a guess, was probably trying to jam Radio Tirana, which operates on 14.320 MHz.

The jammer, which identified as "SM" has been heard before, jamming Radio Beijing, so we can guess from whence it came. Makes on wonder if these people who indulge in these practices have really grown up?

So that's about it for another month. I will say 73 and look forward to hearing from any amateur operator or SWL who hears intruder stations on the amateur bands.

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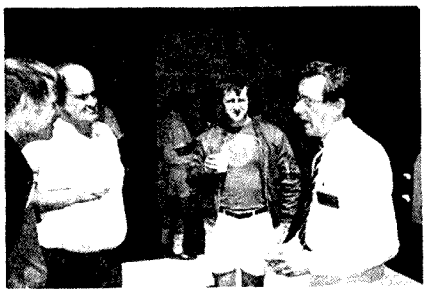
VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

This months notes depict the 1986 Club Conference in photographs. The photographs and captions are courtesy of Bud Pounsett VK4QY.



Michael Owen VK3KI, speaks with David VK4AFA (left), Peter VK4KIP, and Michael VK4YOB.

David Jerome VK4YAN, Queensland Divisional President, with other delegates listens intently to a lecture on packet radio given by John Bews VK4KJB.

During morning tea, Bill Sebbins VK4XZ, talks to Ross VK4IY and Charles VK4BPI.

Below:

Another view of delegates.

LET'S REMEMBER HERTZ

▽ 1986 is the centennial year of Heinrich Hertz's pioneer experiments in electro-magnetic waves. It was in November/December 1886, when he was a professor at the Technical University of Karlsruhe, Germany, that Hertz first watched the discharging of a Leiden jar (nothing else than a large capacitor) through a spark gap, which was in the centre of a three- metre-long copper wire.

Hertz realised that in a similar wire with a gap two-metres apart, small sparks were also generated without any physical connection between the two wire-gap systems. These were the first transmitter and receiver of electro-magnetic waves.

Only a few months later, Hertz found the wave-length of the oscillations (eight metres), their velocity in free space, the influence of resonance, nodes of zero electric effects on the wires, the rectilinear propagation of the waves and their reflection from metal surfaces. Performed in the largest auditorium available, he experimented with wave-lengths down to half-a- metre.

Thus, Heinrich Hertz laid down the fundamentals of all varieties of modern- day communications, including amateur radio. But he did not live long enough to see the results of his work; he died on January 1, 1894.

Written by Wolff Parmentier DJ5JH in *QST* February 1986, and contributed to AR by Steve Mahony VK5AIM

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

The 1986 Clubs Convention, which was our third such event, was held over the weekend of April 11-13, at Cooranga YWCA Conference Centre, Aldinga Beach.

Clubs represented were: Adelaide Hills, Lower Murray, South East (SERG), Second Adelaide Scout Radio Group, LEPARC, ACBRO, SA ATV Group, Darwin, South Coast, Elizabeth and Port Adelaide.

It was the first year that the Adelaide Hills ARS and the Association of Citizens and Band Radio Operators have attended, and I think we all gained much from their input.

From left:Jack VK5FV, Representative from Port Adelaide ARC, Brian Harrison, Australian Association of Citizen and Band Radio Operators Inc, Gordon VK5KGS, Secretary Adelaide Hills ARS.
Photograph courtesy Peter Koen, Secretary VK5BPA

DOWN TO BUSINESS

Friday night was informal. Saturday morning saw the start of the official business and after a welcome and introduction from President Dick Boxall, and a brief word from the delegates about their clubs, we started on the Federal Convention Agenda Items, taking VK5 first. Prior to the start of the afternoon session, we presented Wendy Clegg (wife of VK5AMK), Gill Wardrop (wife of VK5AWM), and Liz Ratcliff (wife of VK5AGR), with a pot plant each as a thank you gift for their Catering Duties at this and the past two Conventions.

VK5 State President, Jenny VK5ANW, with Max VK3ZS, WIA Federal Historian.
Photograph courtesy Peter Koen, Secretary VK5BPA

Wendy Clegg receives a gift for organising the menu and cooking for the past three Clubs Conventions. Husband David VK5AMK, is Head- Buyer.
Photograph courtesy Peter Koen, Secretary VK5BPA

Gill Wardrop receives a gift for cooking for the past three Conventions.
Photograph courtesy Peter Koen, Secretary VK5BPA

Liz Ratcliffe was presented with a gift from the then President of the WIA (SA) Division for her assistance with the meals at the past three Conventions.
Photograph courtesy Peter Koen, Secretary VK5BPA

INFORMATIVE TALKS

After lunch, we were given some most informative "Brief Talks" by Ken Hall VK5AKH, the Federal Awards Manager, John Gough VK5QD, the Divisional QSL Bureau Manager, Bill Wardrop VK5AWM, the Divisional WICEN Director, and Peter Koen, Secretary of the Second Adelaide Scout Radio Group. (Peter is perhaps better known, unofficially, as our "Display Man", which was the topic he chose to talk about).

Many interested visitors attended one or more of the Saturday sessions. It has been suggested that we did not advertise it enough, in fact, 'kept it a secret.' This was not true, however, if we had made it an open invitation to all, without knowing who would be turning up, it could have made catering and seating arrangements rather difficult. Anyone who feels that they would like to attend in the future need only contact whoever is doing the organising so that we know how many will be attending.

GUEST OF HONOUR

Max Hull VK3ZS, the Federal Historian, was our Guest of Honour, and after dinner speaker on the Saturday night. Max showed us a very old film, recently transcribed to video, on Thomas Edison's assistant demonstrating and describing some of Edison's earliest experiments. Max then gave us a very interesting talk on his own early life and how he got involved with radio.

Later still he showed us some slides of historical interest, which had been put together, with commentary, by Chris Long, former assistant curator at the Melbourne Museum of Applied Arts and Sciences. Chris also worked with Peter Wolfenden VK3KAU, and Max, on a tape of Historical Sounds, including the voice of Marconi, to commemorate the WIA's 75th Anniversary last year.

Max presented a copy of this tape to the Division, which by now you may already have heard, via the Broadcast. Members can also purchase copies if they wish. Max was accompanied on this trip by his cousin, Murray Hull VK3KDL, and we were delighted to have both of them with us.

From left: Carol VK5PWA, and Jack VK5AJK, from Lower Eyre Peninsula ARC, David VK5AMK, (then Council Member), Don VK5ADD, VK5 Secretary.
Photograph courtesy Peter Koen, Secretary VK5BPA

Club Representatives and the WIA (SA) Council.
Photograph courtesy Peter Koen, Secretary VK5BPA

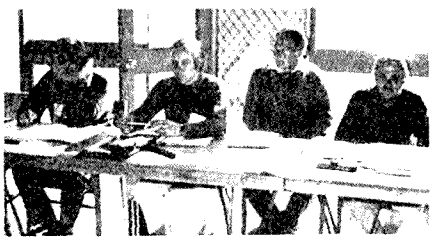
Club Representatives listen intently to Max VK3ZS, WIA Federal Historian.
Photograph courtesy Peter Koen, Secretary VK5BPA

AND INTO DISCUSSION

After listening to the Broadcast on Sunday morning, we finished the remaining Agenda Items and Carol McKenzie VK5PWA, the President of the Lower Eyre Peninsula ARC led us in a discussion on Long Range Plans for the Continuing Growth and Development of the South Australian Division of the WIA. Sub-headings under this title included, the role of the Divisional Council as an Administrator, the planning and

implementation ot zones, whether a separate Adelaide club should be formed, the place within the organisation for the Burley Griffin Building, it's availability to members, use of — by members and groups, and other activities. These were not necessarily the views of Carol or LEPARC, but were being voiced on behalf of many country members, who seem to feel that their fees go to pay for a building and social activities, which, on the whole, they never see or use.

I think, in the end, we decided that about 80 cents per member was the sum we were talking about (having removed the Federal component and costs for such things as the insert in AR, postage, telephone, stationery, and insurance, all of which are of indirect or direct benefit to the country amateurs. One other benefit which gets overlooked by many is the Sunday Morning Broadcast, which is certainly of great benefit to all country amateurs, whether members or not, also costs of repairing or replacing tape- recorders, tapes, and the transmitter room equipment do not always come cheaply, despite our band of willing volunteers who are always endeavouring to keep costs down.



From left: Larry VK8LM, Darwin ARC, Steve VK3YYV and Dave VK3DGJ from the South East RG and Bob VK5ADR, Leader of VK5BPA at the VK5 Clubs Convention.
Photograph courtesy Peter Koen, Secretary VK5BPA

From left: Colin VK5JP, Representative from Lower Murray ARC, Charlie VK5ACF, Representative from ATV Group, Steve VK5AOZ and Vince VK5ZSV, both Representatives from the Elizabeth ARC.
Photograph courtesy Peter Koen, Secretary VK5BPA

Steve VK5AOZ and Vince VK5ZSV, Representatives for Elizabeth ARC.
Photograph courtesy Peter Koen, Secretary VK5BPA

MOVED AND SECONDED

A motion was drawn up as a result of this discussion, which states, "This Conference supports the Divisional Council in the

Max VK3ZS, addresses the Convention.
Photograph courtesy Peter Koen, Secretary VK5BPA

management and administration of the SA Division and encourages all member clubs to nominate a delegate to the Institute as provided for in Rules 105 and 106 of the Constitution."

It was moved by Darwin ARC and seconded by the South East Radio Group, and carried. The business closed at 12.55 pm after which we had lunch and packed up to go home.

SPECIAL THANKS

I would like to thank all who attended for their continued support, and the fact that, despite some "vigorous discussions", some very solid groundwork was laid, on which to build a better understanding between Divisional Council and the Affiliated Clubs.

Meal-time at the Convention.
Photograph courtesy Peter Koen, Secretary VK5BPA

NOTE: For those who like to plan ahead, we have booked Cooranga for the ANZAC weekend next year (April 24-26), also we are looking for more help in the Catering Department. In particular, someone to take Wendy Clegg's place in doing the buying. This should not be too hard as Wendy has kept a record of how much/many of everything is required. Please let me know if you would like to be involved.

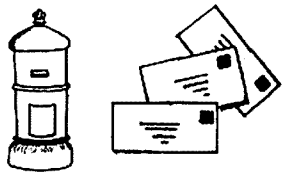
THE SOUTH EAST RADIO GROUP CONVENTION

For many years people have been telling me that I should go down to Mount Gambier, on the Queen's Birthday long-weekend in June, for the SERG Convention. How right they were! Even the weather was reasonably kind to us and as for the hospitality, it could not be faulted. The SERG ladies did a magnificent job with the catering (for 200 on the Sunday), and the events, etc all ran smoothly with the help of the local OMs. I realise that they have been doing it for 22 years and so probably have it 'down to a fine art' but when you realise how many active members of the Club there are, it really makes you appreciate the work that must go into it. There was also a surprise finale this year, when the trophy for the highest aggregate of points went to VK7! That should make the VK3s and 5s even more determined next year. ***See you next year at SERG!!***

STILL MORE J-150 AWARD WINNERS

53VK5NTK	67VK5BEG	81VK5ADD	95VK5YX
54VK7NAI	68VK3COP	82VK1MV	96VK5PDT
55VK5MX	69VK5NDB	83VK5RV	97VK3AEO
56VK6AVK	70VK5BPA	84VK2MMP	98VK5NDB
57VK4NWH	71VK3AEO	85VK2MMP	99VK5BWF
58VK5BJA	72VK5NVC	86VK4NWH	100VK3CQP
59VK5QU	73VK2JBM	87VK5PEB	101VK3CQP
60VK5OU	74VK[illegible]NTT	88VK2NEV	102VK5BL
61VK5GAS	75VK5ADD	89VK7KY	103ZL3KR
62VK5GAS	76VK5NQB	90VK5GAS	104VK5ATN
63VK3DBH	77JH1QYT	91VK5PMW	105VK2JBM
64VK5BUB	78VK5VO	92VK5PMW	106VK5BWF
65VK5AOV	79VK5AJK	93VK5BWH	107VK5AS
66VK3AEO	80VK5VQ	94VK5QW	108VK2VRB
109VK5NVC	133VK5OU	156VK5BMT	179VK5BJE
110VK5HT	134VK5QX	157VK5ALE	180VK5QX
111VK5NTT	135VK5QK	158VK5NNM	181VK5PEM
112VK5NTT	136VK5OX	159VK5NNM	182VK5PEM
113VK5YX	137VK5IT	160VK5NNM	183VK3NWL
114VK5YX	138VK5OU	161VK5QU	184VK5NKA
115VK5PDT	139VK6NEB	162VK5QU	185VK2CWS
116VK5PDT	140VK6NEB	163VK2CXX	186VK5OB
117VK5PRB	141VK6NEB	164VK2CXX	187VK2VOX
118VK5KIA	142W7KSA*	165VK2CXX	188VK2VOX
119VK5PRB	143W7KSA	166VK2CXX	189VK5QX
120VK5AOV	144VK5AJK	167VK2CXX	190VK6AVQ
121VK5AOV	145VK2CDB	168VK5RV	191VK6AVQ
122VK5NEV	146VK2NPJ	169VK5VQ	192VK5OX
123VK5NEV	147VK7NBF	170VK4BAY	193VK6AVQ
124VK5NMX	148VK5AX	171VK5AWM	194VK5NOS
125VK5NEV	149VK2NOG	172VK5AWM	195VK5AX
126VK6NST	150VK5SJ	173VK4NMA	196VK5KIA
127VK5OB	151VK3PKO	174VK4BHW	197VK5KIA
128VK5OB	152VK3PKD	175VK5QX	198VK5KIA
129VK5NOP	153VK7BV	176VK3ABO	199VK5NEW
130VK5NQP	154VK4KNQ	177VK2VRM	200VK5NEW
131VK5QW	155VK5[illegible]PC	178VK4BJE	201VK5UH
132VK5QW			202VK5NEW
			203VK5NEW

NOTE: * denotes first Stateside



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

VK HANDBOOK

There is a perceived need for an Australian Radio Handbook. Apart from one or two slim volumes; licensing requirements, operating techniques, DXing, etc, are, to date the only subjects so far covered in existing literature published in this country. Basic theory is adequately covered in overseas publications such as the ARRL and RSGB handbooks, Scroggies Foundations of Wireless, etc. Unfortunately, much of the constructional content of overseas books specify parts which are at best difficult — usually impossible to obtain in VK.

At present, there appears to be a significant level of interest in antennas, simple QRP transmitters and related devices, DC receivers, measuring instruments and so on. Looking through back issues of AR, it is possible to find a wealth of interesting articles by a number of Australian authors, all making use of locally available components. I put to the membership; would you like to have a handbook — one which attempts to cover a range of technical subjects and projects, put together by Australians?

I would be happy to be involved in such a project, but I do not have the qualifications or the resources to do it on my own. If you think the idea has merit, or would like to contribute time, effort or material, please communicate your comments to the Publications Committee.

Yours fraternally,

Drew Diamond VK3XU,
Lot 2, Gatters Road,
Wonga Park, Vic. 3115.

The Publications Committee has discussed the possibility of producing a handbook along the lines suggested. We need some idea of how many could be sold. If you, the reader of AR, would be interested in contributing to and/or buying such a book, will you please let us know of your interest. Ed.

ar

THOSE WHO KNOCK MORSE

I agree with many of the points raised by Messrs Fatouros, Holliday, de Bruiin, Segal, Batty and Cossins in their thought provoking open letter (page 60, June). The letter would probably have had more credence however, if it had come from a group of rank and file amateurs, rather than a group of so called academics with lots of letters after their names — two of them non-amateurs!

In large organisations — like the WIA (and particularly educational institutions); there is bound to be some 'dead wood.' The way to change this is simple: Join the organisation, make your views known, get yourself elected onto committees, and fix the problems. Any moron can sit in the sidelines slinging mud.

Contrary to the views of those above, I believe that there is a core of truly technically-minded amateurs. This is evinced by the volume of correspondence received seeking advice, offering comments, etc in response to my technical articles in AR. I don't know if there is a sort of chicken and egg problem here, but most suppliers of electronics/radio bits have now made it very difficult for the amateur constructor to obtain his/her small quantities of components. The usual story is something like; *"Yes, we can get that for you. Eight weeks from the USA. Minimum $50 order."* — Pretty discouraging isn't it? If we could get ourselves properly organised, it should be possible for us to overcome this problem.

It is my observation that those who knock Morse are generally those that have;

- attempted the Morse test, failed, and now justify their incompetence by branding it "old fashioned" or "irrelevant in todays computer age", or
- managed to struggle through the test, but have "thrown the key away and forgot the stuff."

Life is like that. It cannot be expected for everyone to have the same interests (happily). My suggestion is that Morse qualifications should only be necessary for those who genuinely like it. An endorsement, after passing the Morse test, would allow the holder to have the use of the LF portions of the bands. This would allow those not interested in Morse, full access to the bulk of the HF bands. Sounds reasonable? I think so.

Yours fraternally,

Drew Diamond VK3XU,
Lot 2, Gatters Road,
Wonga Park, Vic. 3115.

ar

CONGRATULATIONS

Having been a member for a short time, I admit to being very impressed with the efforts in publishing the Call Book and the monthly magazine. Congratulations on both.

Yours sincerely,

Bill Corrick VK3CBG,
7 Glenluss Street,
Balwyn, Vic. 3103.

ar

AMATEUR RADIO COOK BOOK OR FOOD FOR THOUGHT

In answer to the comments of Les Daniels VK2AXZ, in *Over to You!* AR, Vol 54, No 5, headed *Food Recipe Cook Book.*

First of all Les, I would like to thank VK2ZYE for the refund which I received via VK2MMW. I am afraid I have not had the pleasure of meeting VK2ZVE in this matter (perhaps another misnomer?).

I am also very pleased to see that the wording of the advertisement in question has been changed, both in AR and in another well-known amateur radio magazine and no longer appears as it did in AR, January issue this year, and that the price has dropped to $2, or am I wrong? Perhaps the concept of the figure $2 in the metropolitan areas becomes $5 in the Bingara area?

In your reply, you mention wombats in the metropolitan areas Les, I'm afraid I've never seen them up here in Bingara, wouldn't know one if it was served to me on a plate, although I know that DOC has been known to trap them in railway marshalling yards. i do, however, get a lot of galahs on my antenna and I am having a great deal of trouble from power line interference, but I suppose I will have to write to the egg board about that.

If you ever come up this way Les, pop into Bingara, you will find the beer much cheaper, according to your comments on the price of the book compared to schooner of beer.

I am not having a dig at you for raising club funds, Old Man, but I really wish I could get the fish in the Gwydir River to read AR's *Over to You!* I would probably get a bite or two! !

73,

Glyn Gibbings-Johns VK2DJV,
144 Maitland Street,
Bingara, NSW. 2404.

Stop cooking now chaps, no more, please! Ed.

ar

DISCUSSION PAPER

The paper *Amateur Radio — Future Direction* by Jim Linton VK3PC and Roger Harrison VK2ZTB, published in AR, February 1986, was a discussion topic at the 1986 Conference of Clubs of the Queensland Division and the following is a summary of statements and opinions expressed by the delegates and observers from 17 clubs and groups present at this conference. (As a record it is not necessarily authorised by the V[illegible] Division — Ed).

The majority were against any lowering of the present examination entry standards or the granting of certain privileges to those who had not earned them by not reaching an adequate level of proficiency.

Cairns club members viewed with concern the idea of adopting the Japanese Telephony Beginners Licence, which was the result ot a commercial arrangement between the government, the JARL, and equipment manufacturers to create a market for their products.

Furthermore, club members agreed that they did not want to see that sort of thing happen in this country and stated that we must not permit our hobby to be influenced, manipulated or altered by minority groups with selfish, commercial or pecuniary interests.

Surprisingly, many novices were not in favour of the proposals, and indeed two young observers from the Oakey State High School Club said they did not think that the Novice Licence should be handed out on a platter, but should be worked for and that young people could cope with the present Novice Licence.

A Gold Coast delegate said that, as a member of a computer users group, he found that computer people were not interested in amateur radio.

The Central Queensland Branch thought that we have nothing to offer the young computer group as they have modems and use the telephone so why bother with amateur radio.

The radio amateurs group said that many school age people are not interested in amateur radio because computers are all the 'rage'.

The Chairman. Ron Smith VK4AGS, asked, "Why does the press give publication to CB and is unaware of amateur radio activity?"

Gympie Club stated that we do not get publicity because we do not do anything about it and many agreed with this point.

It is clear that the authors have not done sufficient research into why young people are not being attracted to amateur radio.

Instead of trying to play the 'numbers game', as was done with CB and engaging in 'Flights of Fancy' about computers, the authors should have consulted radio clubs around this country who have, for many years, been trying to interest young people in amateur radio. They would have then learned the cold hard facts — mainly that you can only be successful if young people *themselves* are interested.

Furthermore, 'Brownie Badge' licenses, with the lowering of standards and 'giving something for nothing', would certainly destroy incentive at a time when the hobby is becoming more interesting and diverse.

In our society today there are those who want to be university graduates without studying — those who want to be paid without working, etc, and now those who want to be amateur radio operators without meeting any standard.

If those who are calling for a lowering of accepted standards would devote half as much time to studying as they do to writing letters and whining they would have their licenses as other have done.

Recently, a young Queenslander, who has been blind since birth, obtained his unrestricted licence with an exam pass of 91 percent.

So it is humbly submitted that this achievement completely refutes the ridiculous and specious statement by the authors that the present licence structure is not suitable for computer operators — if they cannot cope with it — as this young man has done — then they would or should never become amateur radio operators.

From which element would the amateur radio service gain its strength, those who make an effort to succeed or the whingers?

We have seen and heard what has happened to a portion of the radio spectrum in this country populated by those who have not had to exert any mental effort in order to operate a station.

It seems one of the immutable laws of mankind is that you take care of something in direct proportion to the effort necessary to obtain it.

Most radio clubs have certain ideas about the future of amateur radio which they would be prepared to put to a committee of members with an adequate background and experience in the

hobby — such a committee would need to be completely independent of and not connected in any way with the electronics industry.

If we are to interest our young people in amateur radio, not only as a hobby, but as a training ground for future electronic technicians, there must be motivation and an incentive to succeed by learning and experience, and not by the lowering of standards.

Therefore, the world's oldest radio society and its affiliated clubs must come forward with much better thought-out proposals than these and which reflect the views of the majority of its members.

Ted Gabriel VK4YG,
Cairns Club Delegate,
PO Box 245,
Ravenshoe, Old. 4872.
ar

THANKS VK5

I would like to say thank you to the WIA South Australian Division for organising the "Jubilee 150 Award". I received my certificate in mid-May and was very pleased and impressed with it.

Also, my thanks to all the VK5 amateurs that I had some very enjoyable QSOs with. It took approximately 15 hours of on-air time to gain this award — 15 hours definitely not wasted as I enjoyed every minute.

73,

Arthur Brean VK6SY,
28 Benmow Street,
Trigg, WA. 6029.
ar

DISCUSSION PAPER

I write, yet again, to put forward some more comments and views about the *Discussion Paper,* and the ensuing discussions.

It seems, that once again, CW is attacked. All the letters referred to appear in June *Amateur Radio.*

I have only one comment for Neil Trainor's letter — Hearl Hearl (Particularly the part about costs).

I cannot agree with Max Ives when considering these two points:

1. Okay, so we have a Kindergarten Licence. Like kindergartens in our schooling system, the Kindergarten Licence is not a compulsory item, however it can be beneficial to those who might like to graduate to higher levels but are unsure of their initial steps to get there. Some people lack time and/or facilities to go straight to the higher licence, but wish to get into amateur radio, none-the-less.

2. Max intimates that everyone knows, through unknown means, that amateur radio is what they want. I feel this is wrong — not everyone has amateur friends/relatives to give them an initial sample of life with amateur radio. Some people take the gamble anyway, study for and get their licence, and are, I hope, glad of their effort. However, people are basically lazy and are reluctant to do anything they are unsure of. These people would be more easily encouraged to join amateur ranks if they weren't faced by the daunting task of studying for the Novice Licence.

Maybe I am too young to understand the reference to the "nine days wonder," but I do understand the proverb, and what it means. It is a lot easier to lead a horse to water if it knows what you are leading it to, and it wants a drink! More horses (potential amateurs) will drink (amateur radio) if the water looks clean (unthreatening) and/or is easier to drink. Obviously, if the horse is not thirsty (uninterested in amateur radio) there is little anyone can do, easier licenses or not.

Peter Frederick has some interesting ideas and caused a slight modification to my own ideas. I disagree with his suggestion for the removal of the CW requirement. Sure, five words-per-minute is painfully slow for some, but for others it is the best they have yet achieved.

Peter then goes on to say,"The real traditions of amateur radio are on the HF bands." Agreed. So why remove CW, part of those traditions? Is it expected for all to get to 10 WPM straight off? Some people cannot get to classes and need the on-air experience to get up to those speeds. Would these people be denied full calls because of their geographical location?

I have a suggestion for a solution to the licence argument, and still make amateur radio more accessible.

Introduce *one* new licence (say the Beginner Licence). Give the Beginner limited band space within the Novice allocation on 10 metres. Allow them to transmit 12 watts SSB within this segment. Place a time limit for the holding of a Beginners Licence to one or two years, non-renewable. In this way, the Beginners are on HF with opportunities to work DX and are also able to communicate with all other licence classes, but still with some encouragement for them to upgrade.

Include restricted data transmission facilities for Novices and retain the CW requirement as it stands.

Allow Limited licensees to utilise SSB (and possibly Data), on the same 10 metre segment as the Beginners.

This permits some interaction between all licence classes, and also gives a simple upgrading system. Holders of the Beginners licence can study the slightly more difficult Novice theory, and five words-per-minute CW, or they can study the much more difficult theory for the Limited licence with no CW.

I would like to say that I am opposed to the Canadian Proposals.

It is good to see such discussions flowing on such an important issue and I hope these comments may provide further ideas.

Yours sincerely,

Conrad Canterford VK3PHW,
26 Pyke Street,
Tatura, Vic. 3616.
ar

WANT TO TRADE? ? ?

I am interested in contacting Australian amateurs who would like to trade keys made in Australia for CW keys made in the USA. The particular keys I am interested in are old; eg WWII and earlier, and hard to locate.

I am a serious collector, motivated out of a fascination and love of the objects — I am not seeking profit.

Thank you.

Warren E Burbit K2UVV,
46A Mile Road,
Suffern, NY. 10901. USA.
ar

HOW DO YOU GET IT?

Greetings and thank you for the wonderful job you are doing with *Amateur Radio.* It is a publication of which you can be justly proud.

I have a good friend, Ray Pellowe VE3BAK, who is the editor of the Radio Society of Ontario's magazine *The Ontario Amateur.* I would very much like to send him copies of our magazine. Can you please advise me as soon as possible the subscription rate for such a delivery.

Could you also please advise the copyright position if he ever wanted to use one of your articles in their magazine.

Yours faithfully,

Ron Churcher VK7RN,
PO Box 277,
Devonport, Tas. 7310.

Subscription rates for non-member direct subscriber in Canada are $A28 per annum surface mail or $A70 per annum air mail. You may either pay yourself, or the overseas amateur can be billed. We do not object to occasional reprinting, perhaps two or three items a year, as long as acknowledgment is made of author and source. — Ed.
ar

TECHNICAL CORRESPONDENCE

I enjoyed reading John Gazard's article *Aerials and Earths* in May AR, because he managed to avoid too much mathematics and technicalities. Consequently, I understood enough of it to hear an alarm bell ringing when he described how to calculate aerial impedance by measuring SWR. The alarm bell sounded because although he specified 50 ohm cable he did not specify the length to be used in the test.

Unless the coaxial cable is a multiple of a half wavelength in length, the SWR at the rig will not be true reflection of the antenna impedance. In fact, by using a length other than halfwave multiples, it is possible to trim his antenna to 1:1, even if he has to adjust the coaxial length in the process.

I guess John meant to specify a coax length of halfwave multiples.

As a matter of interest, I checked the SWR on my three element Yagi with the normal coax of random length (that means I have not got around to measuring it yet). I then added a two metre length of coaxial cable and tried again with the results as below.

Frequency	Normal Coax	2m Added
14.005	1.75:1	1.3:1
14.100	1.32:1	1.05:1
14.150	1.20:1	1.06:1
14.200	1.05:1	1.20:1
14.250	1.00:1	1.30:1
14.300	1.16:1	1.51:1
14.345	1.30:1	1.75:1

Makes you think doesn't it.

Yours sincerely,

Noel Davies VK7EG,
30 Spencer Street,
Burnie, Tas. 7320.
ar

FOLLOW-UP PRACTICE

Having been a member of the WIA and holding a call sign for the past three years, I have often read in AR criticism of those new operators as being black box operators only.

I say this is not always the case, but who can blame those who are? For instance, where are the post-theory practical classes for those people after completing the theory and passing the exam? Does the WIA run or encourage such classes or are they contest to push for theory and passes only, content then that membership may increase?

I have made many inquiries during the past few months and have found it difficult to find anyone prepared to take up such an assignment.

I am sure there are many amateurs in the fraternity who would be prepared to attend an organised group and pay for the instruction and any materials used. It may even attract new members for the Institute.

What about it WIA — a practical service to members.

Yours faithfully,

P H Gibbs VK3AQ,
37 Golfwood Close,
Dingley Village, Vic. 3172.
ar

AR AND AMATEUR RADIO

I personally feel that *Amateur Radio* magazines in 1986 have been a little more interesting in comparison to 1985. I think we over- did the anniversary a bit!

As a long time constructor or "Fiddler", I like the technical articles best. It behoves all amateurs to have a go at building some bits of gear. After all, that is what amateur radio is supposed to be about although modern technology is getting a bit beyond a lot of us.

It is hard to please all of the people, all of the time! !

Keep up the good work. It is appreciated and enjoyed by some.

73,

Steve Mahony VK5AIM,
19 Kentish Road,
Elizabeth Downs, SA, 5113.
ar

ATTRACTING YOUNG PEOPLE

The increasing average age of the amateur fraternity is great. I hope we all go on to 100-plus years. The enticement of the young into amateur radio is another problem. My age is 57-years and I have only held a licence for one year.

There are many arguments for and against being an amateur — equipment cost, if one is to be in the swim, is I feel, rather high for young people entering the hobby. Home-brewing satisfying as it may well be, is not a complete solution to the problem.

I was initially shocked to hear a VK full call telling his friend that he is going to sell his two-metre rig and will then buy a UHF-band CB. Subsequently, I am now convinced on one point — as an amateur on air, I can only talk with other

amateurs, where-as on UHF CB, I can talk with family or friends. Perhaps, a better arrangement would be to have a common band, say on UHF, where both amateur and non-amateur can operate together. This may well attract young CB operators enlarge their horizons and attempt to become licenced operators.

Please don't talk to me about CB behaviour patterns, which, I have noticed on UHF CB, are better than can be encountered at times on two metres. This better behaviour on UHF, is, I feel, caused by the large number of novice operators, who, by existing regulations, are forced on to UHF CB.

Yours faithfully,

J R Kemp VK3CAY,
31 Maidstone Street,
Altona, Vic. 3018.
ar

SPIDER QUADS

In 1970, shortly after I designed a "Hub" for Triband Spider Quads, the then editor of *Amateur Radio*, Ken Plncott, asked me to produce a 'rush' article which appeared in the March 1970 issue.

Now, in 1986, I am still, six years after retiring, receiving occasional requests for kits from VKs. Perhaps a short resume will help explain the situation.

Following the publication of the article and advertisements, initially for the "Hubs" only, it became apparent that there was much more interest in complete kits than in bare hubs. So these were offered to the fraternity until about 1977, when Jock Vaile VK3PZ, continued for some years.

Jock supplied kits until the early 80s. Hundreds were sold to VK, ZL and a few hubs to the USA and Europe. Towards the end, sales fell-off to about 12 kits per annum, which of necessity had to be built as a 'batch' to obtain reasonable wholesale prices on materials, so he discontinued offering the kits.

Not wishing to become re-involved in the manufacture of these kits I sought, unsuccessfully, someone else to take it on.

Despite the lack of advertising, inquiries continued due to personal recommendations from satisfied users. I am sure there is at present a pent up demand for quad kits and 50 or more could be sold In the first year.

Does someone wish to add a two-element, multi-band, cubical quad to an existing range of antennas, or engage in manufacture as a 'hobby' activity?

I do not wish to do it myself but I would like to see kits using my hub still on offer to Australia's amateurs.

I have done a quick costing and conclude that the price would be about $350 for a kit consisting of Hub, Fibreglass Spreaders, 100 metres of 1.6 mm hard-drawn copper wire, Aluminium Ferrules and 50 metres of 45 kg (1.0 mm) mono-filament nylon line.

If anyone is interested could they please write to me for further information?

Yours faithfully,

Syd Clark VK3ASC,
30 Heritage Avenue,
Frankston, Vic. 3199.
ar

SATELLITE MONITORING

The Department of Communications has begun a program to monitor the emissions from satellites positioned over Australia and the Indian and Pacific Oceans. The first stage of the project will be Installed early in 1987 in the Australian Capital Territory.

The system will check satellite emissions to ensure they are not Interfering with both land-based and other space communications. Once the system is installed, Australia could be called on by the International Telecommunications Union to help resolve any disagreements between countries on satellite-to-satellite interference.

The system consists of three earth stations, a spectrum analyser and a supporting computer.

SOLAR GEOPHYSICAL SUMMARY — APRIL

Solar activity was low in April with the exception of 24th when three M Class flares were observed. The flares arose from a new region which grew rapidly in the two days prior. They were observed at 0034-0055 UTC, and at 0340-0403 UTC and again at 0603-0707 UTC. The rapid growth of this region was shown by the sudden rise in the 10 cm flux after the 22nd. The region began to decay after the 25th and the values had dropped back to low levels by the end of the month.

The 10 cm flux readings were:
1=72; 2,3=71; 4-11=72; 12=73; 13=74; 14,15=76; 16,17=75; 18-21=74; 22=73; 23=81; 24=86; 25=85; 26=84; 27=82; 28=79; 29=76; 30=74. The average was 75,2 and the sunspot average was 20,4.

The running yearly average was 17,4 for October 1985.

GEOMAGNETIC

April 10 The geomagnetic field was at active levels for most of the day with brief periods of minor storm conditions. A=16.

April was an extremely quiet month even though the equinox months, such as April, are often more disturbed than average. The low monthly average of 7,3 made it the quietest month since 1980. The average level of magnetic disturbance has been falling over the past four years and is expected to reach a minimum around the time of the solar minimum.

HISTORICAL LARGE GEOMAGNETIC DISTURBANCES

The geomagnetic disturbance experienced on February 8, this year, was severe by any standard and its effects on communications were quite dramatic. How did the disturbance compare in severity with others in the past?

The following table lists the 20 most disturbed days since 1932, measured by the planetary disturbance index Ap.

Ranking	Date	Solar Cycle No	Ap Value
1	*November 13, 1960*	19	280
2	*April 1, 1960*	19	241
3	*July 15, 1959*	19	236
4	*September, 1941*	17	230
5	*July 5, 1941*	17	220
6	*Mar 28,1946*	18	215
7	*March 1, 1941*	17	205
8	*October 6, 1960*	19	203
9	*February 8, 1986*	21	202
10	*September 22, 1946*	18	200
11	*July 8, 1958*	19	200
12	*February 11, 1958*	19	199
13	*September 6, 1982*	21	199
14	*March 25, 1946*	18	195
15	*March 24, 1940*	17	190
16	*March 30, 1940*	17	190
17	*October 7, 1960*	19	186
18	*March 25, 1940*	17	185
19	*August 5, 1972*	20	182
20	*March 27, 1959*	19	178

FEATURES

i. Cycle 19 (peak sunspot number of 201 in 1957) made the largest contribution with eight entries. However, Cycle 17 (peak sunspot number of 119 in 1937) contributed six entries in spite of a relatively modest cycle in amplitude.

ii. Most of the disturbances (17 out of 20) occurred after the time of the solar maximum of that cycle.

iii. The equinox months (March-April and September-October) were the worst months with 13 entries.

iv. Even though the November 13, 1960 rates as the single most disturbed day, the period March 24-30, 1940 must rank as the worst week with three entries.

From data supplied by the *Department of Science, IPS Radio and Space Services* — April 1986
ar

QSP

ODD, BUT TRUE!

Recently, a congregation was listening attentively to the minister deliver his sermon.

At one point in the service he asked, "Where is the Devil, now?"

Promptly, a voice replied, with a laconic amateur drawl, over the PA- system, "I'm outside the . . . church in . . .!"

W1AW SCHEDULE for April 27, to October 26, 1986

W1AW code practice and bulletin transmissions are sent on the following schedule. This information may be of interest to the SWLs.

Slow Code Practice	MWF: 0200, 1300, 2300; TThSSn: 2000; Sn: 0200
Fast Code Practice	MWF: 2000; TTH: 0200, 1300; TThSSn: 2300; S: 0200
CW Bulletins	Dy: 0000, 0300, 2100; MTWThF: 1400
Teleprinter Bulletins	Dy: 0100, 0400, 2200; MTWThF: 1500
Voice Bulletins	Dy: 0130, 0430

All times are in UTC. MTWThFSSn are days of the week, Dy is daily.

Code practice, Qualifying Run and CW bulletin frequencies: 1.818, 3.580, 7.080, 14.070, 21.080, 28.080 MHz.

Teleprinter bulletins frequencies: 3.625, 7.095, 14.095, 21.095, 28.095 MHz.

Voice bulletin frequencies: 1.890, 3.990, 7.290, 14,290, 21.390, 28.590 MHz.

Slow code practice is at: 5, 7.5, 10, 13 and 15 WPM.

Fast code practice is at 35, 30, 25, 20, 15, 13, and 10 WPM.

Code practice texts are from *QST*, and the source of each practice is given at the beginning of each practice and at the beginning of alternate speeds. For example: "Text is from February 1986 *QST*, pages 9 and 85" indicates that the main text is from the article on page 9 and the mixed number/letter groups at the end of each speed are from the contest scores on page 85.

On Fridays, UTC, a DX Bulletin replaces the regular bulletin transmissions.

On alternate Saturdays at 2230 UTC, Keplerian Elements for active amateur satellites will be sent on 45.45-Baud Baudot on the regular Teleprinter frequencies. The next date for transmission will be given in regular satellite bulletins.

W1AW CW and voice bulletins are sent on OSCAR-10, Mode B, when the satellite is within range. Look for CW on 145.840 MHz and SSB on 145.962 MHz.

Teleprinter bulletins are 45.45-Baud Baudot, 110-baud ASCII and 100-baud AMTOR, FEC mode. Baudot, ASCII and AMTOR (in that order) are sent during all 1500 UTC transmissions, and 2200 UTC on TTHFSSn. During other transmission times, AMTOR is sent only as time permits.

CW bulletins are sent at 18 WPM.

During communications emergencies, W1AW has special bulletins as follows: voice on the hour; teleprinter at 15 minutes past the hour and CW on the half hour.

W1AW is open for visitors to America from 8 am to 1 pm, Monday through Friday and on Saturday and Sunday from 3.30 pm to 1 am. Visitors are welcome to operate W1AW from 1 to 4 pm Monday through Friday provide they have a copy of their current amateur radio licence.

Condensed from *QST* April 1986

Obituaries

TOM ROBBINS VK5AQ

It is with regret that I record the passing, after a prolonged illness, of Tom on May 19, 1986, at the age of 67.

Tom was employed as an Assistant Draughtsman, by the Adelaide Electric Supply Company, (later The Electricity Trust of South Australia), from December 1936. He graduated as an Engineer at the beginning of the war.

During the war, Tom served as an Engineer Lieutenant on the HMAS *Perth*, which sank in Sunda Strait in 1942. Tom remained a Prisoner of War in Japan for the duration of the war.

He returned to work for ETSA in January 1946 in the Sub-station Department and was later appointed Manager of the Leigh Creek Coal Field, where he served for several years. He was later appointed Regional Manager Upper North at Port Augusta, and remained in that position until his retirement in 1978. He then continued to live at Port Augusta.

Tom obtained his amateur licence in 1935, with the call sign VK5DK, which he held until the declaration of war. After the war he did not renew his licence until 1949, when he was allocated the call VK5AQ. From 1949 he has been active, particularly on 160 metres and more recently in satellite communications. He was well known in the north of South Australia and made many friends in the area.

He had an excellent knowledge of native flora and was also actively interested in the boy Scouts whilst at Leigh Creek and was a strong supporter of the Legacy movement.

Tom will be greatly missed by his many amateur friends throughout Australia and overseas. He was one of nature's true gentlemen!

Deepest sympathy is extended to his wife, Margaret and his family.

Contributed by John Bulling VK5KX
ar

DESMOND LEO BUTLER VK1DL

Desmond collapsed suddenly on the evening of April 28, and passed away on May 4, without regaining consciousness. He had enjoyed good health until then and was very active in community affairs and voluntary hospital work in the Canberra area.

Desmond was born in Lameroo, South Australia in 1916, and in June 1935 entered the Royal Australian Navy, Communications Branch. He served on HMAS *Canberra* (1936), *Vampire* (1938), *Vendetta* (1939). *Australia* (1940), Harman Naval W/T Station (1943/46), and *Shropshire* (1946), as part of the Victory Contingent to England.

He left the Navy in 1947 as a Chief Petty Officer Telegraphist and entered the Commonwealth Public Service, Department of External Affairs in the communications area, and retired in 1976. He obtained his AOCP in 1977 and operated mobile on a complete around-Australia-trip by land cruiser the same year.

Desmond was a component CW operator and obtained his DXCC only a short time after being licensed. He also participated in several telephony networks and was well-known on the amateur bands.

Deepest sympathy is extended to his wife, Jean, son, Michael and daughter Geraldine. He will be sadly missed by his many friends and colleagues of the amateur fraternity.

Contributed by John Gore VK1PG
ar

JOHN KELVIN GARDNER VK3NA

"Kelly" passed away on May 21, at his home, Cannons Creek, Victoria. He was 72.

He obtained his amateur licence in 1931, whilst studying medicine at Melbourne University and later served with the AIF in the middle East and New Guinea.

He was a skilled surgeon and practiced his profession for many years with great distinction and compassion.

In latter times, following the death of his wife, he retired to Cannons Creek on Westernport Bay where he could engage in his two favourite pastimes — amateur radio and sailing.

A high-point in his life was when he joined his sister and her husband in the West Indies, last year, and sailed in their 40 foot yacht through the Panama Canal and across the Pacific to Tahiti. His little FT-7 and a few metres of wire hauled to the mast-head gave great delight to his many amateur friends in VK who followed the yacht's progress.

The tragic death of his eldest son David VK3PBJ, a few weeks earlier doubtless hastened his own passing.

Kelvin leaves two sons, John and Rex, and four grandsons, to whom we extend our sympathy.

Contributed by Rolf Hallamore VK3ARH
ar

CLIFF GOLD VK4CG
1926-1986

Cliff was born in Brisbane in 1906 and passed away peacefully on June 2, 1986.

He came on air in 1926 and experimented on the 5, 20, 32, 80, and 250 metre bands using a Hartley circuit with a UX210 tube. Power was from AC stepped up to 600 volts and rectified through 16 glass jars in bridge form. Grid leak was a jar of water and plate condensers of sheet glass and zinc.

He had QSOs world-wide.

When the Queensland Radio Transmitters League was formed, Cliff became Treasurer, International Contact Station, Vigilance Officer, and member of the QRTL Traffic Branch.

Cliff was a WIA Federal Councillor in 1928.

As mentioned in *Amateur Radio* in October 1982, in a *Thumbnail Sketch*, Cliff was 4GR's announcer and engineer, he was also Uncle Cliff and Willie Evergrow running the children's session. Later, Cliff was Manager and Projectionist of the Empire Theatre, also Toowoomba . . . from whence he sometimes transmitted sound to his wife Grace, on five metres.

Cliff's old friend of some 50 years, the late Bud W6CG (well-known in AMSAT-circles), changed his call sign out of respect for Cliff.

A private cremation service on June 5, was attended by a WIA representative.

Cliff is survived by his wife, Grace, to whom deepest sympathy is extended.

Contributed by Peter Brown VK4PJ
ar

ARTHUR FORECAST VK3AM

With the death of Arthur on June 5, 1986, another member of our fraternity has become a Silent Key.

Arthur was one of the few amongst us who held a licence for 60 years. 3AM was one of the best known of those radio amateurs broadcasting music during the 1920s on 200 metres. One year, he won a gold cup for the most popular station.

On leaving school during the First World War, he became a cinematograph operator and spent most of his working life at the *Victory Theatre*, Saint Kilda, the *Plaza Theatre*, and more recently at the *Croydon Drive-In*.

In his younger days, he was keen on motor-bike racing and was a lifelong friend of the late Ron Hipwell, a well-known champion at the old *Aspendale Motor Race Track*.

In his latter years, when he lived at The Basin, Victoria, he became an expert chicken sexer. He was a skilled mechanic, with a fine workshop and was well-known in Australia and overseas for his knowledge and construction of mobile antennas.

For some years he was Technical Storeman at Channel 2 on Mount Dandenong.

Arthur will be sadly missed from the daily net, which has been operating on 40 and 80 metres for about 25 years. He is only the third of this group to become a Silent Key, the others being Ivor Morgan VK3DH and Gil Miles VK2KI.

He was an early member of the *Radio Amateur Old Timers Club* and will be remembered by his many amateur friends both here and overseas.

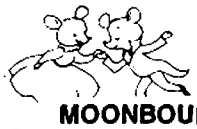
Arthur's wife, Vera, died some years ago. Deepest sympathy is extended to his two sons and two daughters.

Contributed by Keith Ballantyne VK3AKB
ar

Silent Keys

It is with deep regret we record the passing of —

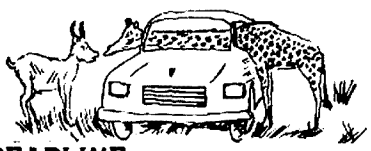
MR DESMOND LEO BUTLER	VK1DL
MR ARTHUR FORECAST	VK3AM
MR JOHN KELVIN GARDENER	VK3NA
MR CLIFF GOLD	VK4CG
MR TOM F ROBBINS	VK5AQ
MR G J WATTS	L30222



QSP

MOONBOUNCE — 1961

▽ For less than $100, W1TQZ built a parabolic-type reflector for 1296 Mc to get set for moonbounce activity. From *QST*, April 1986



DEADLINE

All copy for inclusion in the October 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 21st August 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$2.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $2.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x 220mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office ... 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — ACT

ICOM HF LINEAR AMPLIFIER: Barry VK1ABR, QTHR. Ph:(062) 86 5652 Home or (062) 72 4301 Work.

WANTED — NSW

DONATIONS: of equipment for school radio club appreciated. In particular, a beam or vertical antenna for 3, 21, or 28 MHz is soughl. Matthew Ryan VK2PQG, St Francis' College, Yanco Avenue, Leeton, NSW. 2705. Ph:(069) 53 3622.

ROTATOR: prefer heavy duty. VK2CCC. Ph:(062) 68 4561 Work or 97 7263 Home.

TRANSISTOR DIP OSC SWITCHABLE BALUN: for mobile use. Trio Model CS-1570 30 MHz CRO or equiv. Sig gen 100 kHz-160 MHz, audio oscillator 10 Hz-20 kHz, 2-tone audio osc for SSB wave-form generation. Frequency counter up to 160 MHz. Laurie VK2AQW, QTHR. Ph:(02) 969 2160.

WANTED — VIC

BOOK: Child Development: An Introduction by Steven R Yusen & John W Santrock. L31482. Ph:(03) 725 9285.

BOOK: The History of Radio in South Australia by J F Ross. Variac, 0-270V, 5A or more. Syd Clark VK3ASC, QTHR. Ph:(059) 71 1861.

CDE TYPE CD-44 ROTATOR: required as replacement for damaged unit. Either with or without control unit. Details & price to Frank VK3ZJ, QTHR. Ph:(03) 598 4711.

INFORMATION: from past & present commercial theatre projectionists in all states, who are also amateurs. Wanted with a view to an article for AR. All replies answered. VK3AH, QTHR.

WANTED — OLD

KENWOOD PS20 or PS30 POWER SUPPLY: & VFO 120 external VFO in very good condition. Replies welcome interstate. Please contact Mike VK4VIX, PO Box 471, Redcliffe, Old. 4020.

KENWOOD TS-930S: VK4AK, QTHR. Ph:(07) 369 1706.

POWER SUPPLY: 13.8V to suit FT-707. Minimum 15 amps continuous. Must be in good condition. Also Quartz Crystals in ½" mount (2-10 MHz) & 5.3915 MHz HC-25/U, 40 MHz HC-25/U, 18 MHz HC-18/U. Steve VK4KHQ, QTHR. Ph:(077) 43 4508.

WANTED — WA

HF BROADBAND DIPOLE: T2-FD 200 watt 3.5-30 MHz. Also dual pot 20 kA with switch for stereo tone control. Ken VK6ZA, QTHR. Ph:(09) 398 7829.

FOR SALE — ACT

YAESU FRG-7 COMMUNICATIONS RECEIVER: in good condition. No mods. $200. Keith VK1ZGW. Ph:(062) 58 2250 AH.

FOR SALE — NSW

COMPUTER: TRS80-CoCo, 64k extended Basic, disk drive, joy-sticks, DMP105 printer, cables, manuals, original packing. Software: Scripsit, Flightsim, DataBase. $750. Will separate. Norm McMillan. Ph:(044) 22 1473.

KENWOOD 120V TCVR: $350. Kenwood TL-120 linear amplifier. $100. Kenwood SM-220 station monitor, including pan adaptor. $300. John Clark VK2AUZ. Ph:(02) 520 9509.

MICROLOG AIR-1: in perfect condition for Commodore 64 or Vic 20 computer. Contains all software tor reception of RTTY, CW. $200. Ph:(067) 72 5573.

SCANNER: Pro-30 68-88 MHz, 108-136 MHz, 138-174 MHz, 380- 512 MHz. Direct entry keyboard, LCD display, all books, etc. Mark Vowles VK2VFR, 1 Haynes Avenue, Seven Hills, NSW. 2147. Ph:(02) 671 4832 or (02) 774 5055.

SWAN 350C HF TCVR: in good condition. Similar to Swan 500, with Swan 230X power supply, mic & manual. $200. VK2CDB, QTHR. Ph:(02) 543 4137.

TEKTRONIX 565 DUAL BEAM CRO: 2 probes & manuals, excellent. $350 ONO. AN/URM-250 RF sig gen 10 kHz-50 MHz, excellent. $100. HP low freq oscillator model 202B. $50. FM monitor model 600B. $50. Collins 32RS1 SSB tcvr — 4 switched freqs tuned to between 2-15 MHz, 2 x 6146A finals. $100. Eilco tcvr type 6104A, 12 pos xtal switched. $25. VK2CCC. Ph:(062) 68 4561 Work or 97 7263 Home.

TWO-METRE POWER AMPLIFIER RF ASSEMBLIES: 2 only. Made for 4CX250B valves (2) in parallel. No tubes, power supplies or fans. Quality silver-plated construction with air system sockets. $60 each. Also 3 valves, 4CX250B believed to be okay. $10 each & 2 air system sockets to suit 4CX250B. Unused $20 each. VK2BGX, QTHR. Ph:(02) 559 5508.

YAESU FT-690R 6m ALL-MODE TCVR: not 12 months old with very little use. Paid $380, will sell for $340. VK2KBK, QTHR. Ph(069) 31 1490.

FOR SALE — VIC

CONVERTED CB TO 10m BAND: 28.300-28.600 MHz, SSB/CW with built-in power supply & SWR meter. Also 12V DC leads. Ex cond. $120. Mobile antenna, 80m McLeod heavy duty type. Operates from 3.500-3.700 with heavy duty base mount & 2 springs. Used twice, ex cond. $80 the lot. Mark VK3PUC. Ph:(053) 32 1333.

KENWOOD 2500, 2m FM TCVR: complete with handbook, charger, diagrams. Ex cond $300 ONO. Keith VK3AFI, QTHR. Ph:(052) 21 3658 AH or weekends.

OSKARBLOCK SWR POWER METER: as new, very little use. 3.5- 144 MHz coverage. 52 ohm + 75 ohm impedance power range 2W-2kW. $100 ONO. John Abrim, 13 Brooks Court, Tatura, Vic. 3616.

QUAD HUB BANDIT: cast alloy. New. $35. Hidaka trapped vertical antenna, VS-41 with accessory kit. 80kR & radial kit VS-RG. Exc cond. $75. Peter VK3APS. Ph:(03) 836 7458.

SHACK CLEARANCE: Yaesu FT-107M HF tcvr, matching FC-107 ATU, SP-107 speaker/dummy load & YD-148 desk mic, inc manuals. $850. HyGain TH3MK3 tri-band beam. $200. Emoto 502CXX rotator + control unit. $150. Akigawa PM-3HV HF/VHF SWR + power meter. $20. Dick Smith Q1200 multi-meter $30. HiMound key $10. Will sell the lot for $1100. Tim VK3BXP Ph:(03) 723 3943.

VHF PA TUBES: QQE06/40 (2), QQE03/20 (2), + 3 sockets, 1 set anode conns. $40 the lot. Meters. VU, KM48. $6. AD-86 12V, 1mA movement $5. AD-48 200uA $8. VK3ZXY. Ph:(03) 592 3514.

YAESU EQUIPMENT: FT-101ZD tcvr. $850. Antenna Tuner FC-902. $200. External speaker SP-901. $50. Dummy load watt meter YP-150. $100. Desk mic YD-844A. $50. All items including manuals in immaculate condition. Wal L31285. Ph:(03) 29 4314.

YAESU FT-200 TCVR & MATCHING POWER SUPPLY: 80-10 metres, SSB & CW. Includes desk mic 4D844, manual. Little used, still in mint condition. Ideal second rig or novice. $275. B Bathols VK3UV, QTHR. Ph:(03) 580 8424.

YAESU FT-757GX TCVR: Yaesu FP-757GX switching power supply, Yaesu FC-757AT automatic antenna tuner & headphones. Used once only. $1200. Colin. Ph:(03) 663 1277 BH.

FOR SALE — OLD

KENWOOD TS-130SE HF TCVR: WARC bands, optional fan, mint condition $650. Kenwood TW-4000A 2m/70cm duoband FM 25W, excellent unit, little use, in mint condition. $700. Yaesu FT-230R 2m 25W FM tcvr. VGC $300. VK4BZB. Ph:(07) 345 8731 AH.

FOR SALE — SA

BACK COPIES EA & R, TV & H: 1950s to 1970s. Fair condition. Best offer. **AR**-7 rx with coil boxes, AC power supply. Best offer. VK5QH, QTHR. Ph:(08) 296 6013.

FT-101B & ACC: DC-DC converter, RTTY filter, handbook (FT101E), AM/SSB/CW, 300W input. Oskarblok pwr/SWR meter. Dummy load — 300W. IC-2E 2m hand-held + handbook, external mic, charger & spare battery pack. All ex cond. All offers considered. Simon VK5BSM, QTHR. Ph:(08) 269 1213.

IC-701, PS, MANUAL & MIC: IC-02A, charger & spare battery. Tono Theta 7000 (rec & xmit RTTY, CW, ASCII). All going well. Offer wanted on any. Graham VK5BN, QTHR. Ph:(085) 55 2988.

FOR SALE — TAS

YAESU FL-2100Z LINEAR AMPLIFIER: in mint condition. New valves fitted & have not been used. Cost $800 new, will sell for $600 plus freight. Warren Cure VK7CV, QTHR. Ph:(002) 44 1268.

Advertiser's Index

KENWOOD

pacesetter in Amateur radio

$495

TM 201B **TM 401B**

TS 440S
$1585

TS 940S
$2950

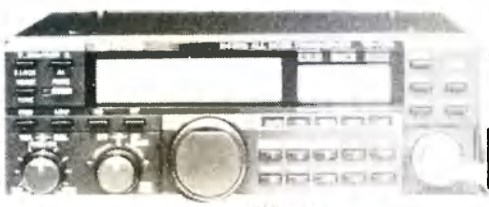
Check the prices and compare competitive models

TS 811A

$1335

TM 2550A
$650

Kenwood is always a winner !



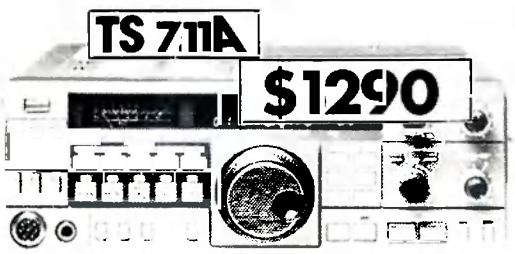
TR 751A
$750

TS 670
$965

$695

TM 2570A

TS 711A
$1290



TH 21A
$320

TH 41A

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

Further, beware of dealers not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Electronics Australia Pty Ltd and have no guarantee applicable.

YOUR DEALER BELOW WILL GUARANTEE SATISFACTION

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NORTHERN COMMUNICATIONS - 249 MARIUS STREET, TAMWORTH (067) 66 6935
FRANK BOUNDY - LISMORE (066) 86 2145

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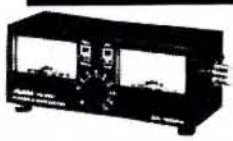

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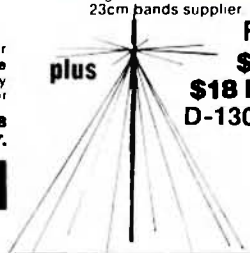

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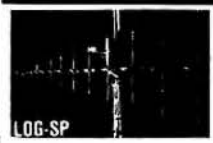

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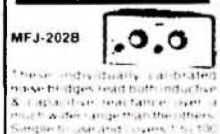

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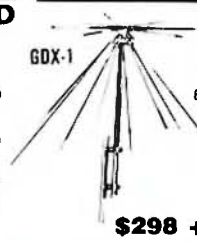

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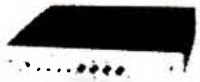

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Debeglass	2.5	1.9	430	3.0	4.3	580
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Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL 54, No 9, SEPTEMBER 1986

The Australian Electronics Monthly

We are proud to announce that we have obtained the rights to publish a substantial part, of our choosing, from the monthly issues of the UK edition of *ELEKTOR ELECTRONICS* within each issue of Australian Electronics Monthly.

This means that, each month we'll be adding around 30 pages (often more) of projects, technical articles and features especially culled from the pages of one of the world's most widely read and respected electronics publications. And you'll get to see the latest material from Europe within weeks of it going on-sale there and months ahead of when it normally appears here!

Projects will be specially chosen and local parts supply sought prior to publication. Printed circuit boards will be available through our PC Board Service and, with the co-operation of retailers, at selected retail outlets. We confidently expect many of the Elektor projects to be available from local suppliers in kit form.

The Australian Electronics Monthly you have come to know and love will continue 'as usual' — the features, technical articles, projects and news. Elektor is planned to be incorporated as an additional section.

What a tremendous BONUS!

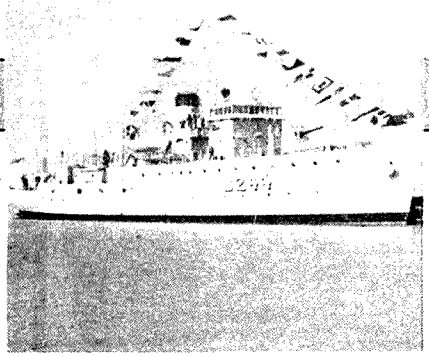
- More projects!
- More features!
- More articles!
- More data!

Every month — commencing with October's issue.

And that's not all! While we're importing material from one side of the globe, we're exporting it to the other! We have also recently concluded an agreement with the US magazine RADIO-ELECTRONICS to exchange editorial material. It seems US hobbyists are particularly enthusiastic about Australian electronics projects and we expect to export more material to Radio-Electronics than vice versa. Whenever topical and relevant features appear in Radio-Electronics, we'll move swiftly to bring them to you in the pages of Australian Electronics Monthly.

Australian Electronics Monthly — bringing you the best, from around Australia and around the world.

Australian Electronics Monthly is edited by Roger Harrison VK2ZTB and published by Kedhorn Holdings, Fox Valley Centre, Cnr Fox Valley Rd & Kiogle St, Wahroonga 2076 NSW.



Photograph © Nucolorvue Productions Pty Ltd

HMAS *Castlemaine*, a historic Naval Ship, Maritime Museum and Amateur Radio Station, docked at Gem Pier, Williamstown, Victoria and preserved by the Maritime Trust of Australia.

Colour photograph courtesy of *Nucolorvue Productions Pty Ltd*, manufacturers of quality cards and souvenirs, Geddes Street, Mulgrave, Vic. 3170. Telephone: (03) 560 1788.

Special Features

Technical Features

Regular Features

Each year, the WIA Publications Committee selects several awards, one of these awards being the Al Shawsmith Journalistic Award. As the name suggests, this award if presented for the best

Amateur Radio

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

article published in *Amateur Radio* from a journalistic point of view. There have been some doubts expressed recently whether the award is well enough known, and as a result, the Editor, in collaboration with Alan VK4SS, has written a brief history (see page 5), of the award and how you, the readers of AR, may make yourself eligible to join the dignified list of recipients.

Amateur Radio is always in need of a steady supply of articles for publication, whether they be short technical tips or long technical articles; even interesting anecdotes. Whilst articles on advanced and new techniques are needed, it must not be forgotten that new amateurs and novices are always interested in good basic items which the "seasoned amateur" may class as too basic for AR. So, write-up that project that has worked for you, as *Amateur Radio* has an enormous appetite for a well-balanced and varied diet.

Preparing an article for *Amateur Radio* is very simple. Just commit your thoughts to paper as you would when explaining to a friend over the air. Manuscripts may be clearly hand-written or typed original copies (no photocopies please, as frequently the photocopier prints a blank in a crucial portion of a technical explanation or formula). Include circuit diagrams if applicable — they do not have to be ready for publication (clear sketches are adequate), as AR's draughts-people will redraw them. Don't overlook a photograph too, but be careful when writing captions on the back — many good photos have been damaged by heavy ball-point pen marks coming through or felt-tip pens smudging from the back of one photo to the front of another.

The Technical Editors are pleased to introduce a new regular column, titled *Technical Mailbox*. The column will endeavour to answer readers queries relating to amateur radio, and the first set of replies may be found on page 51. All readers are welcome to make use of this column.

Gil VK3CGG, has written an interesting article on electronic keyers in very basic, layman's terms, see page 40. Gil is a relative newcomer to CW and his enthusiasm for the mode is contagious.

Drew VK3XU, says Direct Conversion Receivers are here to stay and gives an insight into the principles of operation of such receivers on page 34. Next month, Drew will include full diagrams and instructions for constructors to make their own DC receiver for 80 metres.

DEADLINE

All copy for inclusion in the November 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 22nd September 1986.

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Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162,** *by the 20th day of the second month preceding publication.* **Note:** *Some months are a few days earlier due to the way the days fall. Watch the space below the index for deadline dates.* **Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

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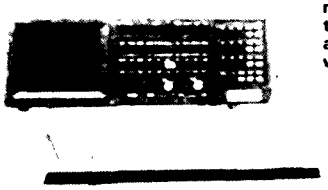

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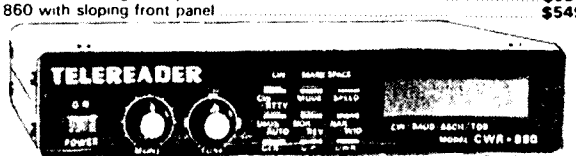

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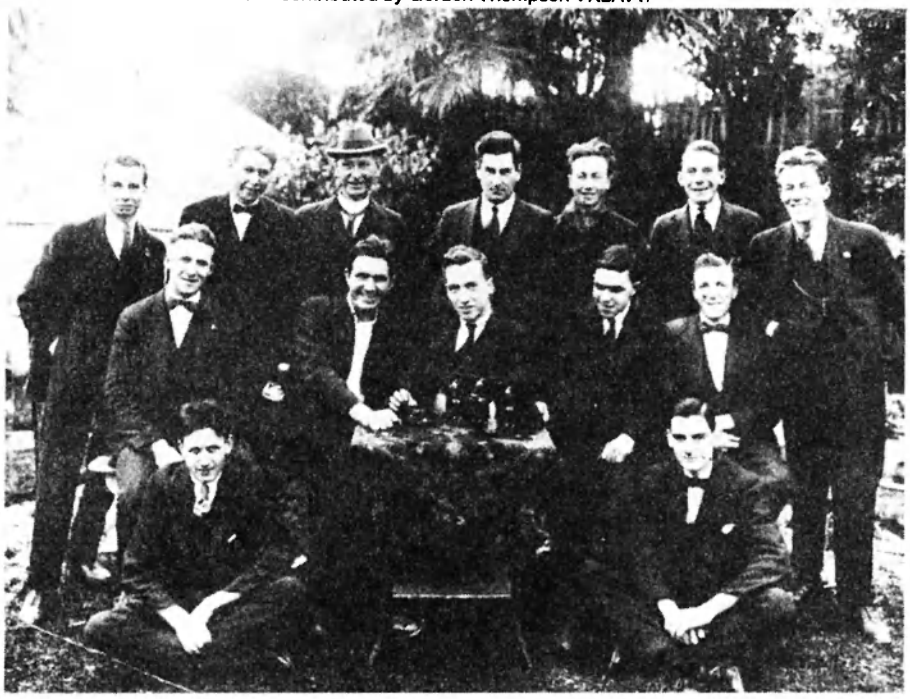
Waverley Amateur Radio Society

The accompanying photographs were taken at the Waverley Amateur Radio Society around 1920 and contributed by Gordon Thompson VK2AVT.



Above

Back row from left: Eric Lavington; Maurice Anderson; F Geddes Snr; Bill Holsgrove; Jack Gordon; Frank Harvey; unknown.
Front row: Neville Ruby; Dan Williams; Allan Burrows; Gordon Thomson; unknown.
Seated: Bill Lawrence; unknown.

Below

Back row from left: Bill Lawrence; unknown; Dan Williams; Les Holsgrove; Frank Geddes Snr.
Front row: Neville Ruby; Frank Harvey; Maurice Anderson; unknown; Allan Burrows; Eric Lavington; Jack Gordon; Gordon Thompson; unknown.

Editor's Comment

A FEATURE BEGINS, ANOTHER RETURNS

At our Publication Committee meeting for July the idea was proposed by one of the Technical Editors that a regular monthly feature be introduced under the title of "Technical Mailbox." We are happy to present the resulting first instalment this month.

Initially, we are providing answers to a backlog of questions which have surfaced from time to time, but we hope that soon you, our readers, will send in to us your questions on various technical topics. Replies will be published on the "Technical Mailbox" page more or less in the sequence in which the questions are received. Of course, some problems may require more research than others to enable adequate answers to be prepared, so these may be delayed a little longer.

As you will see when you read the first instalment a humorous approach has been adopted, but this by no means implies any lack of serious technical "know-how". Many facts are impressed more firmly on our memories when accompanied by a little humour.

One restriction will apply to the subjects to be covered. We would prefer not to become involved with "nuts and bolts" type fault-fixing of specific commercial equipment; but problems of a general kind which may be encountered with any make or model will be addressed. Subject to this limitation, don't hesitate to write in to "Technical Mailbox" and try out our experts!

Re-commencing this month, we once again feature an EMC Column. Hans VK2AOU, is an acknowledged international expert on the subject, and is in a unique position to give us the benefit of the latest developments in this area from West Germany. In that country, technical and legislative measures to promote compatibility are possibly more advanced than anywhere else in the world. It is likely that some of your "Technical Mailbox" problems may involve interference. If so, we can probably advise in this area also, perhaps with help from Hans if the Technical Editors find their expertise is overtaxed.

In all cases, please don't expect miracles to occur overnight! Our unavoidable six-week lead time, plus necessary time to research the problem itself, implies at least a two-month delay between receiving your inquiry and seeing the answer in print. But give us a try! We look forward eagerly to seeing your first batch of problems on our desks!

Bill Rice VK3ABP
Editor

THOUGHT FOR THE MONTH

A change in attitude is always an option.

HMAS CASTLEMAINE

The *CASTLEMAINE AWARD* has been created to celebrate the 75th Anniversary of the *Royal Australian Navy* and the 45th Anniversary of the launching of the HMAS *Castlemaine.*

The *Royal Naval Amateur Radio Society* (RNARS) was founded in the United Kingdom in October 1960, with the purpose of gathering together all radio amateurs who had any connection with the Navy or its allied services.

Headquarters of the Society is situated at the Royal Naval Signal School, HMAS *Mercury,* in Hampshire, UK. Since its formation, membership has been extended to members of the Merchant Navy, including associates in foreign Navies and Merchant Service. There are now over 3000 members world-wide.

Upon joining the Society, members are issued with an official RNAHS number from Headquarters.

The flagship of the RNARS is the HMS *Belfast* which is now a floating museum, permanently moored on the River Thames between Tower Bridge and London Bridge.

Flagship of the Australian Branch of RNARS is the HMAS *Castlemaine,* which is owned by the Maritime Trust of Australia. *Castlemaine is moored at Gem Pier, Williamstown, Victoria, and has a museum on-board where visitors can inspect a fascinating collection of relics and pictures relating to Australia's maritime heritage.*

The RNARS is associated with the ship and have been responsible for restoring the Wireless Office from which an amateur radio station, VK3RAN, is operated.

RNARS members take part in JOTA each year, and encourage Sea Scouts and Guides to foster relationships with their counterparts throughout Australia and overseas.

As a special effort so that amateurs world-wide can attain the Castlemaine Award, Victorian members of RNARS are on air as frequently as possible during 1986, the 75th Anniversary of the Australian Navy. The call sign is operational on weekends and public holidays, and there are special SSB and CW nets on Mondays and Tuesdays. Net frequencies are:

3.613 MHz — Mondays at 1030 UTC
3.527 MHz — Tuesdays at 1030 UTC
7.090 MHz — Sundays at 0300 UTC

(The RNARS is also associated with HMAS *Diamantina* which became operational as VK4RAN this year).

HMAS *Castlemaine,* a Bathurst class corvette/minesweeper, was built at Williamstown, Victoria, and commissioned in 1942. She served with distinction in the northern waters during WWII doing some 117 000 miles on war service.

Following her commission she was engaged escorting convoys between Melbourne and Sydney, and later Townsville to Port Moresby.

In early November 1942, she sailed for Betano (Timor) to embark soldiers and refugees under cover of darkness. Later the same month while in company with HMAS *Armidale,* both ships were attacked but escaped unharmed.

In July 1943, after 327 days of almost unbroken sea service *Castlemaine* was refitted in Sydney. She then recommenced escort work in late August. She was kept busy escorting vessels and carrying troops, stores and mails until mid-1944 when she was re-fitted at Adelaide.

She was then kept busy operating with a survey unit until she was despatched from Darwin on August 16, 1945 to Morotai, Subic Bay (Philippines). She arrived at Hong Kong on the 29th, where patrol work and mine clearance was carried out with the 21st and 22nd minesweeping flotillas.

HMAS *Castlemaine* returned to Melbourne on December 16, 1945.

She served as an immobilised training ship at HMAS *Cerberus* during the 1950s and 60s and was towed back to Melbourne for restoration as a museum ship in June 1974.

Any readers who feel they may qualify to become members of the Society are welcome to contact any members of the RNARS on air or direct to the Australian Branch Manager, Frank Welsh VK3BPV, 13 Central Avenue, Mooroolbark, Vic. 3138, or the Group Manager, Margaret Nally VK3QU, Box 144, Elwood, Vic. 3124.

See also page 51, *Amateur Radio* July 1986, for details of the *Castlemaine Award*

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Bill Tresize VK5RA, an original crew member of HMAS *Castlemaine,* photographed recently in his shack. Bill served aboard *Castlemaine* throughout WWII.

Margaret VK3QU, ex-WRANS, was L/Telegraphist on HMAS *Harman* from 1951-55. She is now the *Castlemaine* Group Manager.

'HISTORY OF THE 'AL 'SHAWSMITH JOURNALISTIC 'AWARD

Every year the Publications Committee selects from the articles published that year three authors who are considered to merit awards for the quality of their work. We have mentioned previously the Higginbotham Award (for meritorious service towards amateur radio), and the Technical Award (for the best technical article or articles). The third is the Al Shawsmith Journalistic Award, the title of which is very nearly self- explanatory.

Recently, however, its founder (Alan Shawsmith VK4SS, who is official historian to the Queensland Division) expressed doubt about whether the Award was well-enough known. We agreed with him that although it was still serving a very useful purpose perhaps some more publicity would encourage more writers to contribute generally-interesting articles to AR, so Al has now sent us this account of the Award's origin.

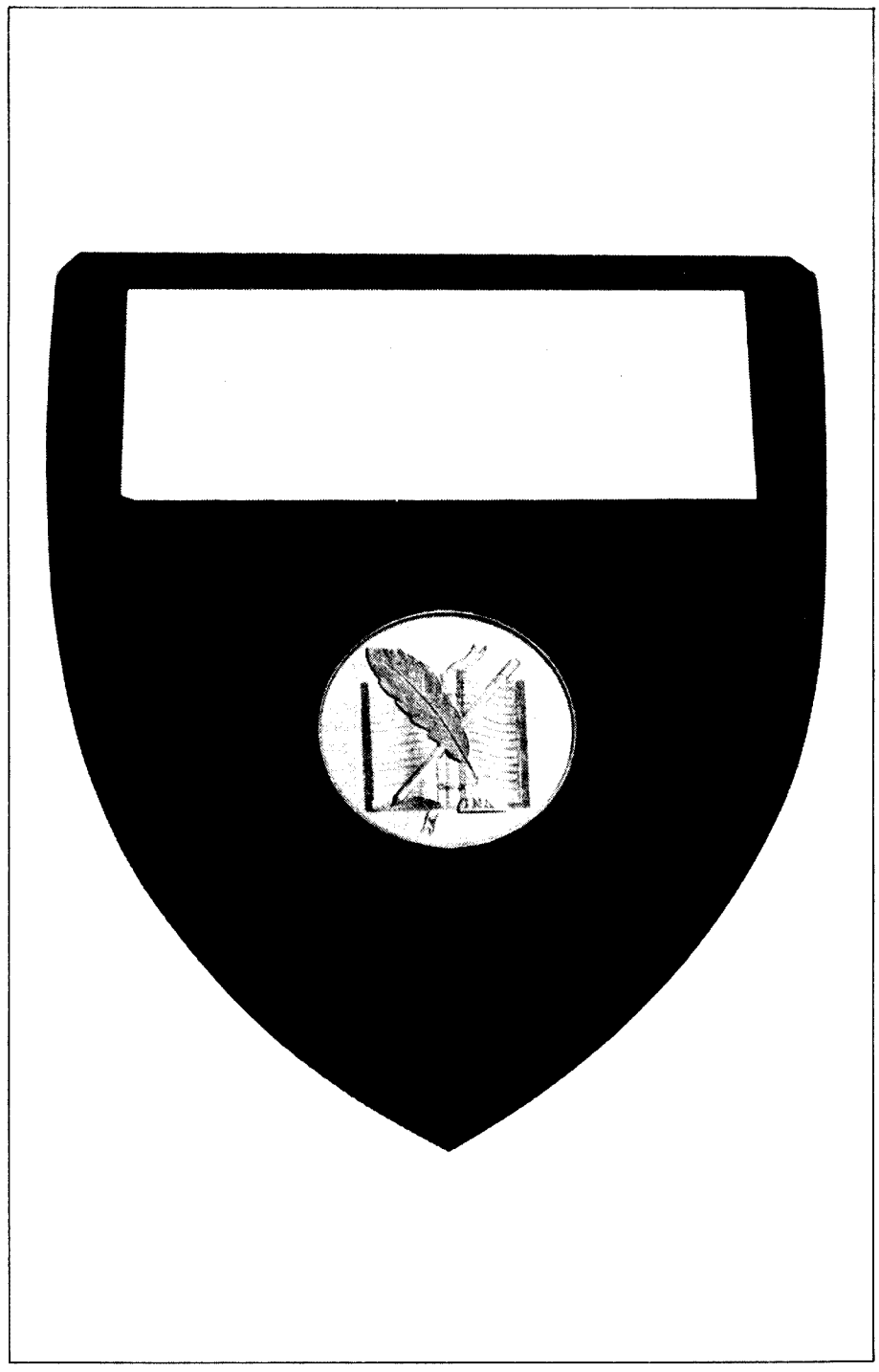
"The idea of ASJA was born after an unexpected visit by a most interesting Old Timer to the shack. On his departure I cogitated that almost all the amateurs I had met over the years had at least one interesting story to tell — be it in human relations, DXpeditioning, adventure, or electronics generally. How was it that so little of this material ever found its way to an Editor's desk?

"In an effort to entice more to put pen to paper, the ASJA was created. Of course no one can know if it has had any catalytic effect on the number of articles or stories subsequently sent to AR magazine, however, from the feedback to hand, it seems to have been well received. Consequently, I'm most happy to continue the award.

"Not everyone has the ability to commit their thoughts to paper in a rational manner. This is an art form in itself. If you have anything that you feel is of sufficient reader interest on any of the above topics, submit it to the Editor yourself or enlist the help of another to do so. This is the only criterion required."

To round off the story, and perhaps to show those with a few years' files of AR what sort of articles have won the Award, here is a list of winners since its inception;

1973 Syd Molen VK2SG "Las Balsas"
1974 Don Marshall VK4ZAF "Brisbane Valley Flood Disaster"
1975 Bill Rice VK3ABP "On Eyre"
1976 B J Morgan VK7RR "A Repeater for Southern Tasmania"
1977 Max Dawkins VK3TR "Some Field Station"
1978 Peter Arriens VK1PA "The Solo Voyage"
1979 Terry Clark VK2ALG "The Living Legend"
1980 Eddy Rooms VK4AER "Radio for the Cruising Yachtsman"
1981 Chris Long "Vale Gil Miles VK2KI — Vale History?"
1982 Alan Campbell-Drury VK3CD "Mayday"
1983 Max Hull VK3ZS "Pioneers of AR in Aust — Max Howden"
1984 Reg Glanville VK2ELG "Clandestine SWLing"
1985 Marlene Austin VK5QO "History of the VK5 Division"



The Award has always comprised an attractive wooden plaque, plus an amount of money, originally $10. This was raised to $15 in 1978, $30 in 1981, and now stands at $100. Who will win it in 1986?

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ANTENNA ARRAYS

PART 2 — The Program

Paul McMahon VK3DIP
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In part one, a number of equations were given which are the basis of the basic program presented here in listing 1.

A few general comments are needed before we begin the discussion on how the program works.

Firstly, as it stands, the program is written for the pseudo MSX Basic of the SVI 318/328 and as such is not directly applicable to such common machines as the Commodore 64 or Microbee. While versions have been modified to run on these machines, it is beyond the scope of this article to describe exactly how this conversion was done. If sufficient interest is shown perhaps this can be the subject of a future article. In the meantime, the program as shown should run with very minor changes on most machines that run a late version of Microsoft Extended Basic.

For example, a version when directly ported across to an Epson PX-8 worked with no changes other than those in the graphics area necessary to cope with the small LCD screen. It should also be noted that different Basics on different machines will produce slightly different results. This is mostly due to the differences in accuracy of the supplied functions and the number of significant digits used along with the machines dynamic range; ie difference between smallest and largest number.

Previously, (References 3 and 6), Fortran has been used on large computers to solve array problems. One of the reasons for this will become obvious to any user of this Basic version, in that it is very slow. For example, a three element array can take up to 25 minutes to calculate true directive gain, or 60 seconds to just calculate the impedances. This should not overly dismay the amateur but, the professional would find the delays excessive. In order to overcome this, in part, the program has been structured in a menu driven format which allows the amateur some control of a trade off between accuracy and time taken.

SECTION 1 — INPUT PARAMETERS

This section, up to line 220, collects data on the array. Unless otherwise stated, all dimensions are input in metres, and all angles in degrees. The elements are positioned on the co-ordinated plane as specified in Part 1, on the X-Z plane; ie Phi = zero. The preferred direction for straight ahead, or the front of the array is 0 and the back 180.

SECTION 2 — IMPEDANCE CALCULATIONS

This section, line 220 to 985, computes the self and mutual impedances of all array elements. It does this using the equations given in Reference 1 which use two functions called sine and cosine integrals. These two functions are evaluated by subroutines at lines 15000 and 14000 respectively. More details on this will be given in a later article.

SECTION 3 — COMPLEX EQUATION SOLVER

Once the impedances have been found, they are assembled into a number of simultaneous equations. The simultaneous equation solver proper is contained in subrouting 40000, however, as standard Basic cannot directly handle complex numbers, the rest of the code in this section, lines 990 to 1460, is involved in manipulating the equations into twice as many real equations.

SECTION 4 — THE MENU

Once the equations have been solved, control is handed to a menu to decide what to do next. This section, lines 1480 to 1520 and subroutine 11000, offer a number of alternatives and some comment should be given on each.

1. Input Impedances — Subroutine 19000. This option will give the input impedances as seen at the centre of all elements. Note these are theoretical values only, plus for any non-driven element; ie voltage equal to 0 angle 0, the impedance will be zero. This of course does not mean that the current will be zero.

2. Change Some Values — Subroutine 22000. Here the user is given the option to go back and change or vary some parameter to see its effect. Note: this routine does not recalculate, after all changes have been made, it will still be necessary to select option (8) and thus recalculate all values. Failure to do this invalidates all results.

3 and 4. Plot E and H Plane — Subroutine 23000 and 24000. As discussed in Part one, the E and H plots show the array pattern. This option gives only the bare bones of the possible graphics routines, as most other machines will have differing modes, etc . . . As it stands, once a complete pattern has been plotted, the operator must hit any key to continue.

5. Calculate Gain and F/B — Subroutine 25000. This is the one that takes the time. It must do the numerical integration spoken of in Part one, over the surface of a sphere. As it stands, it does this in 10 degree increments and, on the SV1318, it takes about 25 minutes for a three element array. This routine is however totally arbitrary as to the pattern is can operate on. This means that no matter what strange configurations are used, the correct answer will eventually be found.

6. Print Currents — Subroutine 26000. This option shows the complex currents flowing in each element.

8. Re-Run — Subroutine 22300. As mentioned previously, this is used in conjunction with option 2 and 10. Option 2 can be chosen any number of times with no other routines between. It is only necessary to choose option 8 before choosing any other option after a series of option 2s or 10s.

9. Review an Element — Subroutine 22200. As the name suggests, this just lists an elements attributes.

10. Change Frequency — Subroutine 22400. This routine is similar to 2 in most respects save it changes the test frequency. Once again it is necessary to option 8 after 10.

11. Quick Gain — Subroutine 16400. As the name suggests, this is a very much quicker version of option 5. It does this by assuming that the antenna pattern is symmetrical about the Z-axis and, only performs the integration over one quadrant. For most Yagi antennas, ie with elements all in the Z-plane, this routine will produce very similar results to option 5.

12. Quick F/B — Subroutine 16700. This routine provides a quick version of front to back, assuming that the front is at Theta equals zero and the back at Theta equals 180.

13. End. Finish program.

In the next part, more details will be given on implementing the program on a micro-computer as well as some of the results that can be obtained.

REFERENCES:
1. J D Kraus — Antennas, McGraw Hill New York 1950.
3. J L Lawson — Yagi Antenna Design, Ham Radio January 1980.
6. S Jaffin — Applied Yagi Antenna Design, Ham Radio May 1984.

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00002 DEFINT I,J,K,L,N
00010 GOSUB 20000
00030 DIM X(20),A(10,22),B(20,22),EC(10,4),EP(10,4),EA(10,2),EV(10,2),EZ(10,2)
00032 DIM I2(20),ES(10)
00040 INPUT "HOW MANY ELEMENTS IN ARRAY ";NE
00050 PRINT "WHAT IS THE FREQUENCY OF INTEREST "
00055 INPUT "IN MEGAHERTZ ";FR
00060 PRINT "ELEMENT NO 1 IS ASSUMED TO HAVE "
00070 PRINT "VOLTAGE IN 1<0°
00080 PRINT "POSITION PHI 0, DISP 0"
00090 INPUT "WHAT IS ITS DIAM AND LENGTH(M) ";EA(1,1),EA(1,2)
00091 PI=3.141592654
00092 P2=6.283185308
00093 EU=.5772156649
00094 DR=PI/180
00100 EA(1,1)=EA(1,1)*FR/300
00110 EA(1,2)=EA(1,2)*FR/300
00120 EV(1,1)=1:EV(1,2)=0
00130 EP(1,1)=0:EP(1,2)=0
00135 ES(1)=0
00160 FOR I=2 TO NE
00170 GOSUB 12000
00180 NEXT I
00190 GOSUB 20000
00200 GOSUB 13000
00210 GOSUB 20000
00212 RF=0
00220 PRINT "FORMING Z MATRIX USING SINE"
00230 PRINT "AND COSINE INTEGRALS PLEASE WAIT"
00240 PRINT ".";
00290 FOR I=1 TO NE
00300 PRINT ".";
00310 XX=P2*EA(I,2)
00320 GOSUB 14000
00330 T1=2*XC
00340 XX=2*XX
00350 GOSUB 14000
00360 T1=XC-T1
00370 T1=.5*COS(XX/2)*(EU+LOG(XX/4)+T1)
00380 XX=XX/2
00390 GOSUB 15000
00400 T2=2*XS
00410 XX=2*XX
00420 GOSUB 15000
00430 T1=.5*SIN(XX/2)*(XS-T2)+T1
00440 XX=XX/2
00450 GOSUB 14000
00460 A(I,2*I-1)=60*(EU+LOG(XX)-XC+T1)
00470 XX=PI*EA(I,1)*EA(I,1)/EA(I,2)
00480 GOSUB 14000
00490 T1=XC
00500 XX=2*P2*EA(I,2)
```

```
00510 GOSUB 14000
00520 T1=T1+XC
00530 XX=XX/2
00540 GOSUB 14000
00550 T1=SIN(XX)*(2*XC-T1)
00560 XX=2*XX
00570 GOSUB 15000
00580 T2=XS
00590 XX=XX/2
00600 GOSUB 15000
00610 T1=COS(XX)*(2*XS-T2)-T1
00620 A(I,2*I)=30*(2*XS+T1)
00630 NEXT I
00640 FOR I=1 TO NE-1
00650 FOR J=I+1 TO NE
00660 PRINT ".";
00670 DM=2*EP(I,1)*EP(J,1)*COS(EP(I,2)-EP(J,2))
00680 DM=SQR(EP(I,1)*EP(I,1)+EP(J,1)*EP(J,1)-DM)
00690 T1=.5
00700 T2=SQR(DM**DM*T1*T1)
00710 XX=P2*(T2-T1)
00720 GOSUB 14000
00730 T3=XC
00740 XX=P2*(T2+T1)
00750 GOSUB 14000
00760 T3=T3+XC
00770 XX=P2*DM
00780 GOSUB 14000
00790 A(I,2*J-1)=30*(2*XC-T3)
00800 A(J,2*I-1)=30*(2*XC-T3)
00810 XX=P2*(T2-T1)
00820 GOSUB 15000
00830 T3=XS
00840 XX=P2*(T1+T2)
00850 GOSUB 15000
00860 T3=T3+XS
00870 XX=P2*DM
00880 GOSUB 15000
00890 A(I,2*J)=-30*(2*XS-T3)
00900 A(J,2*I)=-30*(2*XS-T3)
00910 NEXT J
00920 NEXT I
00930 PRINT
00940 FOR I=1 TO NE
00950 A(I,2*NE+1)=EV(I,1)*COS(EV(I,2))
00960 A(I,2*NE+2)=EV(I,1)*SIN(EV(I,2))
00970 NEXT I
00980 GOSUB 20000
00982 FOR I=1 TO NE
00983 A(I,2*I-1)=A(I,2*I-1)+ES(I)
00985 NEXT I
00990 PRINT "DONE NOW SOLVE ";NE;" COMPLEX"
01000 PRINT "SIMULTANEOUS EQUATIONS "
01010 PRINT "PLEASE WAIT "
01020 PRINT ".";
01030 FOR I=2 TO 2*NE STEP 2
01040 FOR J=1 TO 2*NE+2
01050 PRINT ".";
01060 B(I-1,J)=(-1)^(J+1)*A(I/2,J)
01070 IF J/2=INT(J/2)THEN B(I,J)=A(I/2,J-1)ELSE B(I,J)=A(I/2,J+1)
01080 NEXT J
01090 NEXT I
01100 PRINT
01105 GOSUB 40000
01340 PRINT
01350 FOR I =1 TO NE
01360 PRINT ".";
01370 EC(I,3)=X(2*I-1)
01380 EC(I,4)=X(2*I)
01390 EC(I,1)=SQR(EC(I,3)*EC(I,3)+EC(I,4)*EC(I,4))
01400 EC(I,2)=ATN(EC(I,4)/EC(I,3))
01401 IF EC(I,3)<0 THEN EC(I,2)=EC(I,2)+PI
01410 NEXT I
01420 PRINT
01430 GOSUB 20000
01440 PRINT " DONE, ALL CURRENTS HAVE "
01450 PRINT "NOW BEEN FOUND "
01455 GOSUB 16000
01460 PRINT
01470 GOSUB 18000
01480 GOSUB 20000
01490 IF RF=1 THEN 210
01495 GOSUB 11000
01500 INPUT " CHOICE  ";Q
01510 ON Q GOSUB 19000,22000,23000,24000,25000,26000,27000,22300,22200,22400,164
00,16700,65000
01520 GOTO 1480
11000 PRINT "(1) INPUT IMPEDANCES  (11) QUICK GAIN"
11010 PRINT "(2)CHANGE SOME VALUES (12) QUICK F/B"
11020 PRINT "(3)PLOT E PLANE       (13) END"
11030 PRINT "(4)PLOT H PLANE "
11040 PRINT "(5)CALC GAIN AND F/B "
11050 PRINT "  (THIS ONE MAY TAKE"
11060 PRINT "    SOME TIME)"
11065 PRINT "(6) PRINT CURRENTS"
11070 PRINT "(8) RE-RUN "
11075 PRINT "(9) REVIEW AN ELEMENT "
11076 PRINT "(10) CHANGE FREQ "
11080 RETURN
12000 GOSUB 20000
12010 PRINT "FOR ELEMENT ";I;" INPUT "
12020 PRINT
12030 PRINT "VOLTS IN (FOR PARASITIC "
12040 INPUT " =0,0) MAG,PHASE(DEGS) ";EV(I,1),EV(I,2)
12045 EV(I,2)=EV(I,2)*DR
12050 PRINT "POSITION RELATIVE TO EL 1"
12060 PRINT "ANGLE (DEGS),DISPLACEMENT(METRES)"
12070 INPUT "   ";EP(I,2),EP(I,1)
12080 EP(I,2)=EP(I,2)*DR
12090 EP(I,1)=EP(I,1)*FR/300
12100 PRINT
12110 PRINT "DIAM AND LENGTH "
12120 INPUT "IN METRES ";T1,T2
12130 EA(I,1)=T1*FR/300
12140 EA(I,2)=T2*FR/300
12145 INPUT "SERIES R OHMS ";ES(I)
12150 GOSUB 18000
12160 RETURN
13000 PRINT " DO YOU WISH TO REVIEW OR CHANGE"
13010 INPUT " ANY ELEMENT (YES/NO)";QQ$
13020 IF LEFT$(QQ$,1)<>"Y" THEN 13100
13030 INPUT "REVIEW OR CHANGE (R/C) ";QQ$
13040 IF LEFT$(QQ$,1)="C" THEN GOSUB 22000
13050 GOSUB 22200
13060 GOSUB 20000
13070 GOTO 13000
13100 RETURN
14000 REM COS INTEGRAL
14010 NN=INT(XX*1.5+5)
14020 XC=1
14030 XC=1-XC*(XX*XX*NN)/((4*NN+2)*(NN+1)*(NN+1))
14040 NN=NN-1
14050 IF NN>0 THEN 14030
14060 XC=EU+LOG(XX)-XC*XX*XX/4
14070 RETURN
15000 REM SIN INTEGRAL
15010 NN=INT(1.5*XX+5)
15020 XS=1
15030 XS=1-XS*(XX*XX*(NN-.5)/(NN*(2*NN+1)*(2*NN+1)))
15040 NN=NN-1
15050 IF NN>0 THEN 15030
15060 XS=XS*XX
15070 RETURN
16000 FOR I=1 TO NE
16010 EZ(I,1)=EV(I,1)/EC(I,1)
16020 EZ(I,2)=(EV(I,2)-EC(I,2))/DR
16030 NEXT I
16040 FOR I=2 TO NE
16050 EC(I,1)=EC(I,1)/EC(1,1)
16060 EC(I,2)=EC(I,2)-EC(1,2)
16070 NEXT I
16080 EC(1,1)=1
16090 EC(1,2)=0
16091 FOR I=1 TO NE
16092 EC(I,3)=EC(I,1)*COS(EC(I,2))
16093 EC(I,4)=EC(I,1)*SIN(EC(I,2))
16094 NEXT I
16095 RETURN
16100 SP=SIN(PH*DR)
16105 CP=COS(PH*DR)
16110 CT=COS(TH*DR)
16120 ST=SIN(TH*DR)
16130 SI=0
16140 SR=1
16150 FOR IT=2 TO NE
16160 T1=P2*EP(IT,1)*(SIN(EP(IT,2))*ST*SP+COS(EP(IT,2))*CT)+EC(IT,2)
16170 SR=SR+EC(IT,1)*COS(T1)
16180 SI=SI+EC(IT,1)*SIN(T1)
16190 NEXT IT
16200 F2=SR*SR+SI*SI
16210 F1=0
16220 T1=ST*CP
16230 T2=SQR(1-T1*T1)
16240 IF T2=0 THEN 16260
16250 F1=COS(PI*T1/2)/T2
16260 F2=F1*F1*F2
16270 RETURN
16400 T2=170*DR
16410 T3=10*DR
16420 UM=0
16425 PR=0
16430 FOR TH=0 TO T2 STEP T3
16440 SR=1
16450 SI=0
16460 FOR IT=2 TO NE
16470 T1=P2*EP(IT,1)*COS(EP(IT,2)-TH)+EC(IT,2)
16480 SR=SR+EC(IT,1)*COS(T1)
16490 SI=SI+EC(IT,1)*SIN(T1)
16500 NEXT IT
16510 F2=SR*SR+SI*SI
16520 IF F2>UM THEN UM=F2
16530 UA=P2*T3*F2*SIN(TH)
16540 PR=PR+UA
16550 NEXT TH
16560 DI=4*PI*UM/PR
16570 GI=4.342944819*LOG(DI)+2.15
16580 GOSUB 20000
16590 PRINT USING " GAIN IS APPROX = ###.## DBI ";GI
16600 GOSUB 18000
16610 RETURN
16700 GOSUB 20000
16710 GOSUB 25150
16720 RETURN
18000 INPUT "HIT ENTER TO CONTINUE ";QQ$
18010 RETURN
19000 REM DRIVING IMPEDANCES
19010 GOSUB 20000
19020 FOR I=1 TO NE
19030 PRINT "FOR ELEMENT NO. ";I
19040 TZ=EZ(I,1)
19050 TX=EZ(I,2)
19055 IF TZ<1E-04 THEN TX =0
19060 PRINT USING "IMPEDANCE= ###.### ANGLE ###.## DEGS ";TZ,TX
19068 TX=TX*DR
19070 T1=TZ*COS(TX)
19080 T2=TZ*SIN(TX)
19090 PRINT "OR"
19100 PRINT USING "  ###.###   + J  ###.### ";T1,T2
19110 PRINT
19120 PRINT
19130 NEXT I
19135 GOSUB 18000
19140 RETURN
20000 CLS
20010 PRINT " GENERAL PURPOSE ANTENNA ARRAY ANALYSER"
20020 PRINT " BY PAUL MCMAHON VK3DIP   10/11/85 "
20030 PRINT
20040 RETURN
22000 GOSUB 20000
22010 INPUT "WHICH ELEMENT DO YOU WISH TO CHANGE ";NC
22020 IF NC>NE THEN 22100
22030 I=NC
22035 GOSUB 12000
22040 RETURN
22100 PRINT "THIS IS LARGER THAN THE CURRENT"
22110 PRINT "SIZE OF THE ARRAY "
22120 INPUT "DO YOU WISH TO ADD IT ";QQ$
22130 IF LEFT$(QQ$,1)<>"Y" THEN 22000
22140 PRINT "THIS WILL BE ADDED AS ELEMENT ";NE+1
22145 NE=NE+1
22147 NC=NE
22149 GOSUB 18000
22150 GOTO 22030
22200 GOSUB 20000
22210 INPUT "WHICH ELEMENT TO REVIEW ";NC
22220 I=NC
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22230 PRINT "FOR ELEMENT ";I
22240 PRINT
22250 PRINT "VOLTS IN (FOR PARASITIC "
22260 PRINT " =0,0) MAG,PHASE(DEGS) ";EV(I,1),EV(I,2)/DR
22262 PRINT "POSITION RELATIVE TO EL 1"
22263 PRINT "ANGLE (DEGS),DISPLACEMENT(METRES)"
22264 T1=EP(I,2)/DR
22265 T2=EP(I,1)/(FR/300)
22270 PRINT "    ";T1,T2
22272 PRINT
22273 PRINT "DIAM AND LENGTH "
22274 T1=EA(I,1)*300/FR
22276 T2=EA(I,2)*300/FR
22280 PRINT "IN METRES ";T1,T2
22282 PRINT "SERIES R OHMS ";ES(I)
22285 GOSUB 18000
22290 RETURN
22300 RF=1
22310 RETURN
22400 GOSUB 20000
22410 INPUT "WHAT IS NEW FREQ (MHZ) ";F2
22420 FOR I=1 TO NE
22430 EP(I,1)=EP(I,1)*F2/FR
22440 EA(I,1)=EA(I,1)*F2/FR
22450 EA(I,2)=EA(I,2)*F2/FR
22460 NEXT I
22465 FR=F2
22470 RETURN
23000 PH=0
23005 GOSUB 23700
23006 SCREEN 1
23007 PRINT " VK3DIP"
23008 LOCATE 180,10
23009 PRINT "LOG SCALE"
23010 TH=0
23016 CIRCLE (96,96),96,4
23017 CIRCLE (96,96),64,4
23018 CIRCLE (96,96),32,4
23019 PSET (96,96),4
23020 GOSUB 16100
23030 GOSUB 23100
23032 LOCATE 180,30
23033 PRINT "1008/DIV"
23040 FOR TH=10 TO 360 STEP 10
23050 GOSUB 16110
23060 GOSUB 23100
23070 NEXT TH
23071 LOCATE 200,150
23072 PRINT "HIT ANY"
23073 LOCATE 200,180
23074 PRINT "KEY "
23075 QQ$=INKEY$
23077 IF QQ$="" THEN 23075
23078 SCREEN 0
23080 RETURN
23100 IF F2=0 THEN F2=1E-07
23101 T3=32*(.43429*LOG(F2/T4)+3)
23102 IF T3<0 THEN T3=0
23105 XP=96+T3*COS(TH*DR)
23110 YP=96-T3*SIN(TH*DR)
23120 PSET(XP,YP)
23130 RETURN
23700 T7=PH
23710 GOSUB 20000
23720 PRINT "MAXIMUM GAIN IN WHAT DIRECTION "
23730 INPUT " THETA,PH (DEGS) ";TH,PH
23740 GOSUB 16100
23750 T4=F2
23755 PH=T7
23760 RETURN
24000 PH=90
24010 GOTO 23005
25000 REM GAIN
25002 PR=0
25004 MX=0
25030 FOR PH=10 TO 360 STEP 10
25050 FOR TH=10 TO 180 STEP 10
25060 RT=TH*DR
25070 GOSUB 16100
25080 IF F2>MX THEN MX=F2
25090 UA=.030461742*F2*SIN(RT)
25100 PR=PR+UA
25110 NEXT TH
25120 NEXT PH
25130 DI=4*PI*MX/PR
25135 GOSUB 20000
25140 PRINT "GAIN = ";4.342944819*LOG(DI);"DBI"
25150 PH=90
25160 TH=0
25170 GOSUB 16100
25180 T5=F2
25190 TH=180
25200 GOSUB 16100
25210 T5=4.342944819*LOG(T5/F2)
25220 PRINT " FRONT TO BACK = ";T5;"DB"
25230 GOSUB 18000
25240 RETURN
26000 REM PRINT CURRENTS
26010 GOSUB 20000
26020 FOR I=1 TO NE
26030 PRINT "ELEMENT NO. ";I
26040 PRINT USING "CURRENT= ###.### ANGLE ###.## DEGS.";EC(I,1),EC(I,2)/DR
26060 PRINT USING " ###.### + J ###.### ";EC(I,3),EC(I,4)
26070 PRINT
26080 PRINT
26090 NEXT I
26095 GOSUB 18000
26100 RETURN
27000 RETURN
40000 N=NE*2
40005 FOR I=1 TO N
40010 X(I)=B(I,N+1)
40020 I2(I)=0
40030 NEXT I
40040 D3=1
40050 FOR I=1 TO N
40060 B1=0
40070 FOR J=1TO N
40080 IF I2(J)=1 THEN 40170
40090 FOR K=1 TO N
40100 IF I2(K)>1 THEN 60000
40110 IF I2(K)=1 THEN 40160
40120 IF B1>=ABS(B(J,K)) THEN 40160
40130 I3=J
40140 I4=K
40150 B1=ABS(B(J,K))
40160 NEXT K
40170 NEXT J
40180 I2(I4)=I2(I4)+1
40210 IF I3=I4 THEN 40280
40220 D3=-D3
40230 FOR L=1 TO N
40240 SWAP B(I3,L),B(I4,L)
40250 NEXT L
40270 SWAP X(I3),X(I4)
40280 P1=B(I4,I4)
40290 D3=D3*P1
40300 B(I4,I4)=1
40310 FOR L=1TO N
40320 B(I4,L)=B(I4,L)/P1
40330 NEXT L
40350 X(I4)=X(I4)/P1
40360 FOR L1=1 TO N
40370 IF L1=I4 THEN 40440
40380 T=B(L1,I4)
40390 B(L1,I4)=0
40400 FOR L=1 TO N
40410 B(L1,L)=B(L1,L)-B(I4,L)*T
40420 NEXT L
40430 X(L1)=X(L1)-X(I4)*T
40440 NEXT L1
40450 NEXT I
40610 RETURN
60000 PRINT "MAT ERROR "
60010 STOP
65000 END
```

International News

QSP

RESTRUCTURING THE CANADIAN AMATEUR SERVICE

Following are the recommendations made by the CRRL and the CARF, Canada's two national organisations.

Permit home-built equipment for all classes of certificate.

Use a no-code entry level certificate, *Certificate B*, to attract newcomers to the amateur service.

Base *Certificate B* on 40 hours of study of basic electronic theory, basic electronic circuits, receiving and transmitting systems, antennas and propagation, station set-up and operation, interference prevention, and radio regulations.

Allow holders of *Certificate B* to use up to 100 watts input with all modes on amateur bands above 30 MHz.

Offer attractive incentives such as 250 watts input, and CW and RTTY on amateur bands below 30 MHz, to encourage holders of *Certificate B* to work for a seven words per minute *Code Endorsement*.

Also, offer phone in the 28-29.700 MHz band, as is done in 14 jurisdictions around the world, to holders of *Certificate B* with the *Code Endorsement* to give them a sample of privileges they could enjoy with the highest-class certificate, *Certificate A*.

Base *Certificate A* on 20-30 hours of study of advanced electronic theory, receiver and transmitter circuitry, and antenna systems, and 12 WPM Morse code.

Allow holders of *Certificate A* to use maximum legal power with all modes on all amateur bands.

The national organisations spent considerable time developing these recommendations. They had to consider the needs of the amateur radio community and the needs of DOC. They had to ensure that their proposed structure would be attractive to newcomers, offer strong incentives to upgrade and stress high standards throughout.

From *CRRL News*, June 15, 1986

VIATEL TAKES OFF

The performance of Australia was second only to France in the introduction of Videotex Information Services.

Telecom's Viatel service has 16 000 users and more than 200 independent organisations are providing information to the service.

THE JOY OF BEING AN EDITOR . . .

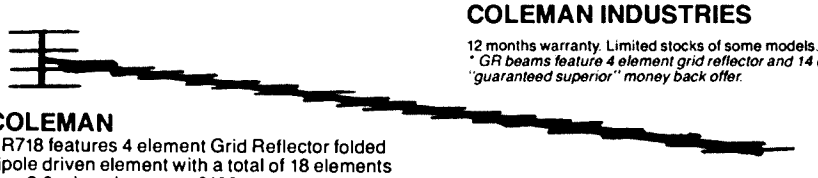
Getting out this journal is no picnic,
If we print jokes people say we are silly;
If we don't they say we are too serious.
If we copy things from other magazines,
We are too lazy to write them ourselves;
If we don't print all contributions,
We don't appreciate true genius . . .
If we print them the journal is filled with junk,
If we make a change in the wording of a contribution,
We are too critical;
If we don't we are criticised.
It is quite likely someone will say that we even borrowed this from some other magazine;
As a matter of fact *we did*.

Adapted from *BARG NEWS* June 1986

ANDREWS COMMUNICATIONS SYSTEMS

COLEMAN INDUSTRIES

12 months warranty. Limited stocks of some models.
** GR beams feature 4 element grid reflector and 14 day "guaranteed superior" money back offer.*



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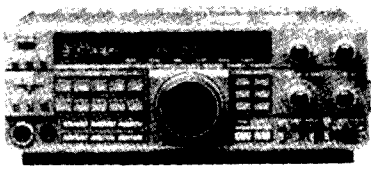
GR718 features 4 element Grid Reflector folded dipole driven element with a total of 18 elements on a 3.6m long boom . . . **$199**

NEW COLEMAN BEAMS.
- GR728, 28 el on 430 MHz band
- GR210, 10 el on 144 MHz band
- 603Y, 605Y, 606Y 52 MHz beams

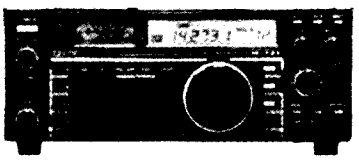
COLEMAN BEAMS NOW IN STOCK
- 2m models, 204Y . . . $19, 205Y . . . $29, 208Y . . . $49, 2011Y . . . $69.
- 208x8 dual-polarity . . . $119.

- KENWOOD PS.50 P/Supply $349
- WELZ SP-420 140-525 MHz, Watt-meter, 4/20/200W, SWR meter **$129**
- CORONA/JUMBO HP.240DX, 200W RF o/p 3-30 MHz, adj rx amp, 4 pos o/p. (Compare to HL-200E and save!) ..... **Only $329**



KENWOOD TS-440S . . . $1550
Includes automatic tuner, mic. Why pay $1585? HF transceiver 100 ch memory, 100W RF o/p, SSB-CW-AM-FM, 0.15-30 MHz rx, selectivity switch, notch, IF shift, NB, etc.
Full 12 months warranty.

- 25-1 300 MHz Discone in stock $199
- Kenwood TW.4100 Dual-bander coming.
- Call for Kenwood & Icom items not advertised.
- RF Power Transistors in stock; 2SC.2290 $40 ea, 2SC.2783 $69 ea, 2SC.2381 $39 ea.
- New BEARCAT/UNIDEN scanners in stock!



ICOM IC-731 . . . $1499 *Last few.*
Excellent receive performance HF transceiver w/12 ch memory, 100W RF o/p, SSB-CW-AM-FM, 0.1-30 MHz rx, PBT, notch, etc. Full 12 months warranty.

CHIRNSIDE ANTENNAS
- CHIRNSIDE CA-33 3 el tribander $379
- CHIRNSIDE CA-35DX 5 el tribander on 6m long boom, uses 2 x 10 m elements $479
- CA-5 s/s 5-band vertical, 6m long $149
- CHIRNSIDE helicals, 80-10m types ..... $39 ea
- CHIRNSIDE CA-42 15/10m Yagi $179
- RG-213 $2.50/m. RG-8/U $1.50 per metre.
- Mobile One HF Helicals ..... $35 ea.

Factory direct importer of high quality THP

THP HL-110V 3/10-110W 2m linear amplifier w/GaAsFET rx $699

TOKYO HY-POWER LINEARS
- HL-62V 10-60W 2m GaAsFET rx $349
- HL-160V25 25-160W 2m MOSFET $799
- HL-60U 10-60W UHF GaAsFET rx $499
- HL-120U 10-100W UHF GaAsFET rx $899
- HL-2K 2kW i/p, 160-10m, 2 x 3-500Zs included, WARC, 30% bigger plate xfmr **$2250**

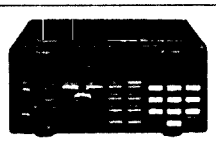
Other THP Products available on indent.
90 day warranty

KENPRO ROTATORS —
Directly imported
- *KR-600RC, 600kg/cm rotation torque, 4 000 kg/cm braking torque, Only $399
- Few "SKY KING" TV rotators left at $99 ea.
- *Top & bottom mast clamps inc. Control cable . ..... **$2.00/m, 6 conductor.**

TELEREADER CWR-880 RTTY/CW TERMINAL $579
Telereader CWR-880 allows CW/RTTY/AMTOR reception. This amazing new communications terminal features an LCD screen with 16 characters x 2 lines.
90 day warranty

FT-270H **$679** ~~$879~~
Yaesu FT-270H 2m FM features 10 ch memory, rptr, 45/5W o/p, 0.2 uV sensitivity, PMS.

FRG-8800 **$950** ~~$1145~~
Yaesu FRG-8800 comms receiver allows 150 kHz to 30 MHz reception. AM/FM/SSB/CW.



Inc MMB-28 bracket

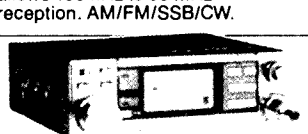
FRG-965 **$950** ~~$1090~~
Yaesu FRG-965 V/UHF scanning receiver covers 60-905 MHz. AM/FM/SSB. AC/DC.

70cm

FT-726R **$1899** ~~$2120~~
Yaesu FT-726(R) SSB/FM/CW, 10W o/p, AC/DC transceiver.
inc 2m mic. DC

KENWOOD TM-201B
$495

FM 2m 45/5W mobile, 5 ch memory transceiver. Compare to KYOKUTO and AZDEN 25W radios.
12 months warranty on our Kenwood.



YAESU FT-2700RH **$950** ~~$1095~~
Dual bander, 70cm/2m, 25W, FM, 0.2 uV, 10 ch mem, PMS.

Professional scanning receiver covers 25-550 and 800-1300 MHz in two continuous tuning ranges. AM/FMN/FMW, 0.3 uV AC/DC. Priority, delay, etc.

AOR AR- 2002

$899

KURANISHI FC-965 . $219
Converts 0.5-60 MHz signals up to 60.5-120 MHz thereby allowing MW/SW/Low VHF reception with the FRG-965 or similar rx.

UNIDEN RD-9 NOT $499, OUR PRICE $449. RADAR DETECTOR

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AN AMATEUR RADIO ENGINEERING PROJECT

Kenneth Kimberley VK2PY
21 Nicoll Street, Lakemba, NSW. 2195

This paper traces the development of a precision 10 MHz "reference" oscillator and later, a square wave generator locked to the reference. The expected range of the generator would be from approximately 0.1 hertz to three megahertz.

Since work began on the above, it has been ascertained that 5 MHz is often used within the industry in lieu of 10 MHz. Does this imply that the lower frequency is more stable, or is it merely economic consideration? My opinion is that it is a little of both!

The basic accuracy and stability of the proposed generator will be governed by the reference. Hence, it was decided to concentrate work on the crystal oscillator and develop it as far as practical.

Most of the amateur radio type literature tends to treat quartz oscillators fairly lightly. This gives the impression that their design and subsequent construction is relatively simple. Nothing could be further from the truth, as the author discovered. This, I might add, at the cost of considerable time and pocket money.

Having got through the preamble, it is now time to get down to the nitty gritty. Firstly, what circuit would be used? It was noticed that a lot of equipment uses an oscillator based on Ic gates. The only external components required being two resistors, a trimmer, the crystal and naturally the IC.

The absence of a "LC" circuit and tricky feedback adjustments make this oscillator look very attractive indeed. Hence, it was decided to proceed along these lines. Refer to Figure 1 for details and component values, etc.

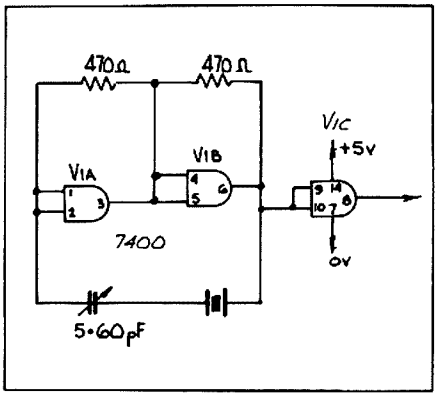


Figure 1 — Series Mode Oscillator using TIL Gates.

The use of a TTL device (7400) was more or less dictated by virtue of the high operating frequency. Having settled on the circuitry, off went the cheque to one of the *Amateur Radio* advertisers and soon two beautiful little rocks arrived.

No technical specifications were supplied, however the covers were stamped 10.000.000. The frequency must be correct. I found out otherwise — the hard way.

Now out with the soldering iron, "blob" type proto-board and the small components. Sockets for both the crystal and IC were cannibalised from some long unfinished project. Some 30 minutes later the thing was up and running — beaut!

The counter was then switched on and both allowed to stabilise for about one hour. The frequency was then adjusted to an indicated frequency of exactly 10.000 MHz. Now, as the reader will agree there is not any point in pushing ones luck too far. Therefore, it was decided that as the next day was a Saturday, the equipment would be left running all night.

Surprise, surprise. Murphy had come visiting overnight and had slyly changed the frequency. Considering that the previous night's stabilisation had not been sufficient, the trimmer was readjusted.

About this time, a friend visited the shack. As he walked past the work area the frequency changed. Each time he walked past he produced similar results, as did opening and closing the window. Apparently, the breeze thus produced varied the temperature sufficiently to move the frequency. The second crystal (number 2) behaved in a similar manner.

Placing the oscillator into a cardboard box eliminated this effect quite nicely.

LESSON NUMBER ONE

Open type construction is definitely not conducive to good stability in oscillators.

The next problem to be addressed was the rather long and uncertain warm-up period, which was somewhat masked by the previously mentioned problem. This erratic operation appeared to be caused by some thermal effect. Now, what can heat up In such a low power circuit? Neither smoke or charring being visible meant that it was time to introduce the good old "calibrated finger" technique.

This was poked hither and thither around inside the box and it eventually landed onto the 7400, which was quite warm.

The finger in contact with the top of the IC acted as a heat sink. As its temperature dropped so did the frequency.

The fitting of another 7400 did not improve things, so a 74LS00 was tried. This lower-powered device produced less heat and did not effect the frequency as much. However, the drift was still quite unacceptable!

LESSON NUMBER TWO

The active element can, and does have an adverse reaction on the oscillator.

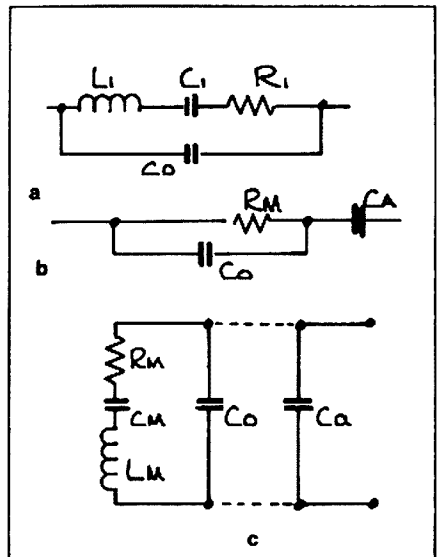


Figure 2 — Equivalent Circuits of a Crystal

Well, how to proceed from here? Further work on the drawing board and more reading was required.

It was learned that parallel mode oscillators seem to be intrinsically more stable than series versions. It appears as though most simple and "on chip" oscillators are of the series type.

These are mainly used where the stability requirements are not so stringent. Hence, most of the cheaper rocks advertised and sold locally are cut and calibrated for series mode at 25 degrees Celsius. More of this later.

DEFINITIONS

At this stage, a brief explanation of the terms series and parallel modes will be given.

The generally accepted equivalent circuit of a quartz crystal is shown in Figure 2a, where Co represents the static (shunt) capacitance and is the sum of the capacitance between the electrodes and all of the other strays. The R_1, L_1 and C_1 network is known as the motional where C_1 is the motional capacity of the blank. L_1 is a function of the mass and the R_1 is the total losses.

FORMULAS

L_1 =Motional Inductance = $\frac{1}{4\pi^2 F_s^2 C_1}$

C_1 =Motional Capacitance = $\frac{2(C_o+C_L)\Delta F}{F_s}$

ΔF =Change in Frequency = $\frac{F_s C_1}{2(C_o+C_L)}$

Q =Quality Factor = $\frac{1}{2\pi F_s C_1 R_1}$

R = Equivalent Series R = $\frac{2\pi F_s L_1}{Q}$

C_o Shunt Capacity
C_L Load Capacity
C_T Total Capacity

SERIES RESONANCE (FS)

Other names are the Motional Resonance or zero point and it occurs when XL_1 equals XC_1; ie

$$FS = \frac{1}{2\pi\sqrt{L_1 C_1}}$$

At this frequency the reactances cancel, hence the impedance is set by the Equivalent Series Resistance (ESR), and is of course resistive. Refer to Figure 2b. It is worth noting that series types of circuits will continue to oscillate when the crystal is replaced with a capacitor. The frequency being that at which the circuit has the greatest gain.

PARALLEL RESONANCE (FP)

There is another frequency at which a crystal looks resistive and this is when XLm and XCm plus XCo equals zero. This parallel, or anti- resonant frequency is given thus:

$$FP = \frac{1}{2\pi\sqrt{\frac{C0\,C1}{CT + C1}\,L1}}$$

The equivalent circuit for this condition is shown in Figure 2c. This point is also known as the pole. Hence the expression "FP."

When a crystal is operating near parallel resonance (FP) it will look inductive in the circuit. Some texts therefore refer to the Inductive Mode in lieu of parallel. Its impedance is maximum at FP. A change in circuit values will pull its frequency and therefore the load capacity should always be specified. For this mode the load capacity should be selected to operate at a point on the reactance curve as close as possible to FS.

The well tried and proven *Colpitts* circuit was chosen, so out came the 7400s. Put them in the junk box for future digital projects. Figure 4 shows a typical circuit and gives typical values, etc.

Almost any small signal transistor may be used for Q1, although higher gain units will allow greater stability. The circuit shown in Figure 4 was roughly put together and worked first try. However, the frequency could not be pulled lower than about plus one kilohertz from that desired. Crystal number two performed similarly.

Now refer to Figure 3. Notice that series resonance always occurs lower than the parallel frequency. The variation can be between say one and 10 kHz depending on cut, manufacturer, etc. It is not generally realised that a crystal calibrated for the parallel mode may generally be used for series providing that a "suitable trimming C" is employed.

However, the converse does not apply as was demonstrated by the performance of crystals one and two.

LESSON NUMBER THREE

The crystal must always be operated in the mode for which it was calibrated.

Ho, Hum — the last of the big spenders. So away with another cheque to a local manufacturer for crystal number three, ordered as a type DBD 40 10.000.000.

SPECIFIED CHARACTERISTICS

Cost — *Reasonable*

The quoted part number describes the crystal characteristics as follows:

D represents Temperature Range -10 to +60 degrees Celsius

B represents Temperature Stability ±5 ppm
D represents Calibration Tolerance ±5 ppm
UO represents Load Capacity of 40 pF

The crystal also has a resistance welded case which offers better long term stability than the solder or epoxy sealed types.

Whilst awaiting delivery of number three, the experiment continued. Already it was obvious that the Colpitts was much superior to the gate type oscillator. Thus work was concentrated in this direction.

Refer to Figure 4, feedback is governed by the ratio of C1:C2, reducing as C2 is increased. Additionally, larger values tend to mask minor changes within Q1, hence leading to higher stability, etc. Unfortunately, the law of "Diminishing Return" comes into play here. You see high "CS" progressively lowers the Z, Q and hence stage gain. It follows that a lower Q produces a broader bandwidth and consequently more oscillator noise, which could then be a problem in receiver mixers, etc. A value of 100 pF appears to be near the upper usable limit.

DARLINGTON PAIR

For the purist (myself included) further improvement may be made. The method suggested is to add another transistor, Q2, and connect both into a *Darlington* configuration. The idea is to achieve a much higher gain and input impedance, thus making possible the use of larger values in the capacitor divider. The upper limit now being around 1.0 nF effectively swamping the reaction of the active devices on the oscillator frequency. Refer to Figure 5 for details.

At last the great day arrived — the little package containing crystal number three arrived. The new crystal was soon installed into the latest oscillator. A quick turn of the trimmer and the thing was running on 10.000.000 (indicated), whilst still exhibiting excellent stability. At this stage of development it would probably be satisfactory for most amateur requirements. The frequency shift had, by now, been reduced to an erratic ± few parts in 10^7; ie several hertz in 10 MHz.

TEMPERATURE PROBLEM

Now why is this variation? The only uncontrolled parameter appeared to be temperature. Investigations along these lines were commenced. The requirement being a variable heat "hot box" and a thermometer. The hot box (oven) is made up as follows. Obtain a small cardboard box (about 100 x 60 x 60 mm) and make three suitable holes in the lid. One in the middle for the thermometer and

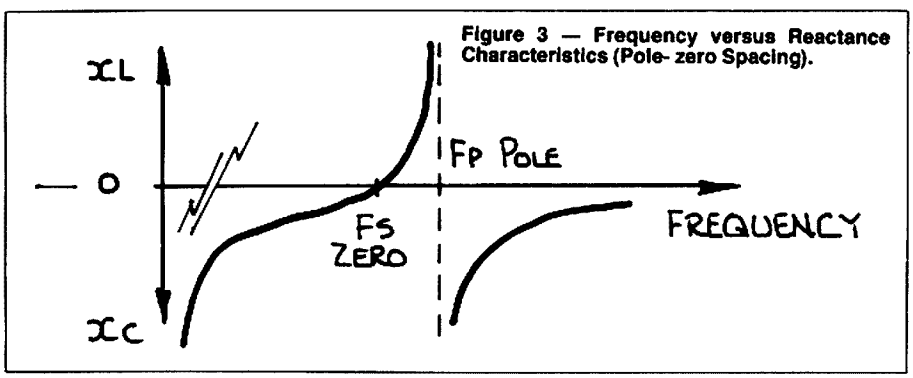


Figure 3 — Frequency versus Reactance Characteristics (Pole- zero Spacing).

POLE ZERO SPACING

Figure 3 demonstrates the frequency versus reactance characteristics of a quartz plate. Note that at frequencies below FS and above FP it becomes capacitive and of course at FS and FP is resistive.

The pattern repeats at each overtone frequency; ie third, fifth, seventh, etc.

COLPITTS OSCILLATOR

Having digressed a little, let us get back to our loading problems. It transpires that "parallel" circuits can be designed so that the active device has a minimal affect on the oscillator frequency.

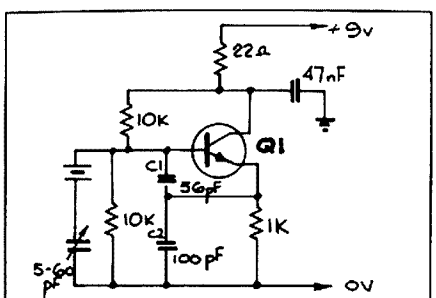


Figure 4 — Typical *Colpitts* Oscillator.

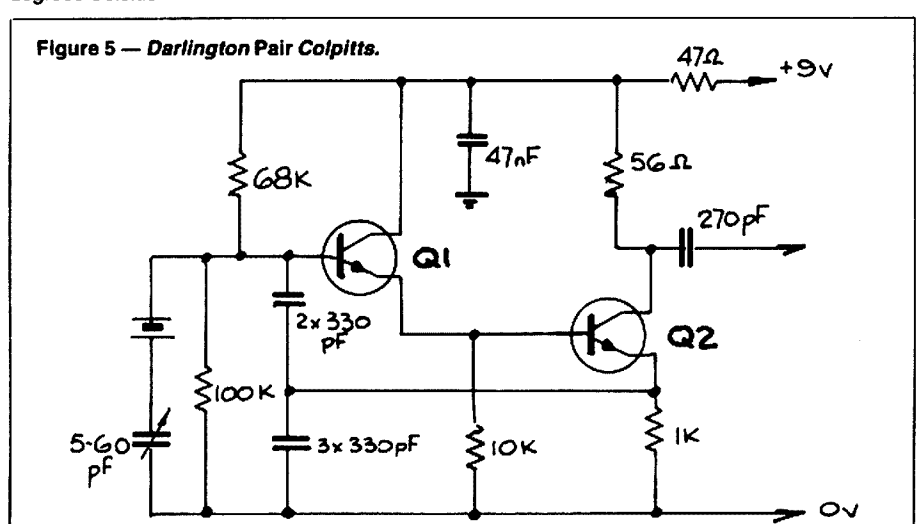


Figure 5 — *Darlington* Pair *Colpitts*.

the others approximately 40 mm away on either side. The heater connections come out through one, and the oscillator wires, the other.

Next, four 4.7 ohm wire wound resistors are obtained and located vertically in the box at the centre of each side. Bend the leads out of the way and then connect each resistor in series to give a total value of 19 ohms. Join an insulated wire to each end and thread same through the designated hole. Place the oscillator into the box and feed its associated cables out through the other hole. Replace the lid on the box, push thermometer into position and power the oscillator. A zero to 25 volt power supply is connected to the 19 ohm heater.

The PSU is now switched on and set at 20 volts, corresponding to about 20 watts dissipation into the hot box. The temperature should now rise steadily and if it reaches 80 degrees Celsius, all is well.

If not, the heater resistor will require alteration. Assuming 80 degrees Celsius is attained, switch heater off, allow oven to stabilise for say 10 minutes. Now, record heater voltage, temperature and frequency. Switch power back on, reduce output to 19 and do the recording bit again. Repeat the process at one volt decrements right down to zero.

A graph of the frequency varies temperature should now be drawn using an easily read scale; ie 1" = 10 degrees Celsius and 1" = 10 Hz. Refer to Figures 6 (crystal 3) and 7 (crystals 1 and 2) as examples. The voltage/temperature recordings will be of assistance for later measurements. The results obtained for crystal three were very instructive. Notice the linear drop from 25 to 44 degrees Celsius, followed by the sudden jump (10 Hz) with only one degree further increase. At this point, the frequency slowly climbs until 70 degrees Celsius is reached then another rapid drop followed by runaway at 75 degrees Celsius.

The manufacturers specify an operating range of from -10 degrees Celsius to +60 degrees Celsius for this crystal. As it would be too difficult to verify the low temperature characteristics, and in any case the actual operating point would be above 20 degrees Celsius, it was decided that having verified the 20 degrees Celsius to 60 degrees Celsius part of the manufacturers specifications not to proceed with the low temperature measurements.

OPERATING TEMPERATURE — COMPENSATION ETC

Temperature compensation could well be used between 20 and 40 degrees because of the approximate linear drop in frequency. However, stability would be degraded with further increase. This is due to the compensating capacitors now being virtually "out of phase."

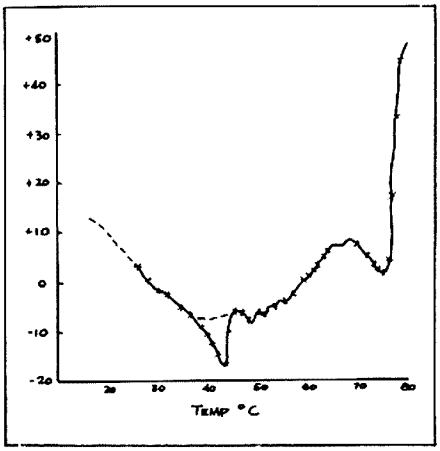
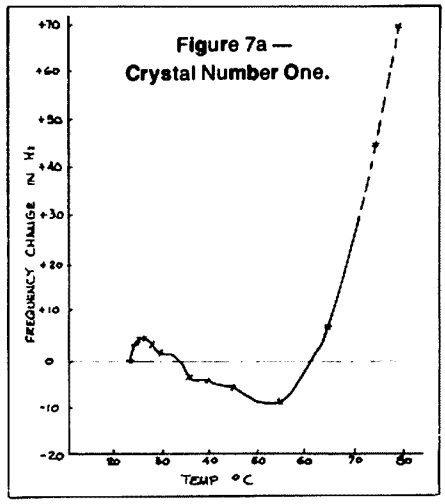
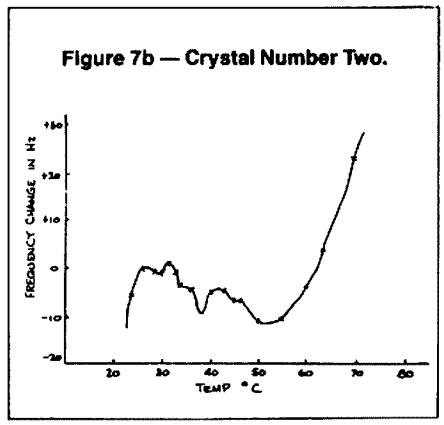


Figure 6 — Crystal Number Three, DBD40. Temperature versus Frequency Change.





Even though crystals one and two were discarded, it was decided to put them through a heat cycle. Refer to Figure 7 for the results, which over a limited temperature range, were surprisingly good. Observe the 27 degrees Celsius turn-over point and frequency change of only ±3.000 Hz between 24 and 33 degrees Celsius. This ties in well with the 25 degrees Celsius operation mentioned earlier. Again, compensation could be used between 27 and 55 degrees Celsius.

However, TCXOS are fiddly, compensating components hard to come by and usually require individual adjustment, thus making life difficult for the constructor silly enough to follow in my footsteps.

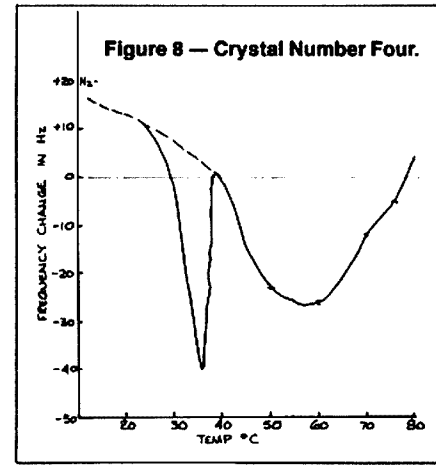
Note the flat spot between 35 and 45 degrees, even a relatively poor controller set at 40 degrees would be adequate here as a ±5 degrees change would only change the frequency by just 10.000 Hz.

The degree of control attainable persuaded the author that temperature control was a must. The proposed operating point was arrived at as follows. Allow say a maximum summer shack ambient temperature of 35 degrees plus. Add a further 10 degrees increase from associated circuitry, together with a fudge factor gives a total of say 50 degrees Celsius. The controller cannot work if set below the prevailing ambient.

Therefore, 55 degrees Celsius was selected and coincides with commercial practice. Yet another crystal (number four) was ordered, thus adding to my steadily growing collection of 10 MHz crystals! This one was specified as a type KBD40 10.000.00 (+ desired holder type), and having the following characteristics:

Cost — Expensive (Don't tell the cook)
Operating temperature — +50 to 60 degrees Celsius
Temperature Stability — ±5 ppm
Calculated Tolerance — ±5 ppm
Local Capacity — 40 pF
Sealing — Resistance Welded.

When number four duly arrived it was given the good-old heat treatment. Figure 8 depicts the results of these efforts. Despite the rather poor performance at lower temperatures, it was excellent between 50 and 60 degrees Celsius, exactly as ordered an ideal for the proposed 55 degrees Celsius operating point.



LESSON NUMBER FOUR

Ensure that the crystal is always used at its specified temperature.

Next month, Part 2 of this article will describe the construction, adjustment and performance of the temperature controlled crystal oscillator.

To be continued . . .

ar

AEA SOLD

Antenna Engineering Australia (AEA) has been acquired by Kabelmetal Electro of West Germany.

AEA is a Melbourne-based company concerned with the design and manufacture of antennas, filters, diplexers, multi-couplers and associated equipment for communications, FM and AM broadcasting, television and navaids from low frequency to microwave.

From *Electronics News*, July 1986

VK SUPPLIES MODEMS TO JA

Datacraft has made significant sales of its Australian designed and made Telelink modems to the Tokyo office of an international bank.

Datacraft Telelink modems are designed to provide a cost effective solution to internal networking requirements, since they allow for simultaneous voice and data transmission, using existing PABX equipment and cables within a one kilometre range.

Datacraft's export team is now evaluating the potential of the Japanese market as there is no comparable product available there.

From *Electronics News*, July 1986

ELECTRONIC CAMERA

A filmless still-camera that captures images with a computer chip and plays them back via a television monitor is expected to on sale soon.

The system, which uses floppy disks, also allows a photographer to send pictures over telephone lines.

Using a device called a transceiver, images sent over a telephone line can be reproduced using an ink-jet printer.

The camera looks and acts like a conventional 35 mm camera, but instead of film, the image is captured using a special kind of chip called a charge- coupled device, which passes the signal to a 5 cm wide floppy disc.

Besides photo-journalists, the camera will be useful in law enforcement, construction, industry and science.

LEARN MORSE ON YOUR COMPUTER

Kevin Bond VK3CKB ex-VK3ZKB
57 Thomas Street, South Morang, Vic. 3752

Your computer can be an excellent Morse instructor.

It is available whenever you want to practice, sends perfectly spaced Morse with no interference or fading — but there are a few traps, as I discovered. This article may help others to avoid them.

After 18 years of holding a limited call, and recently becoming interested in home computers for sending RTTY, there arose a need to experiment over a distance too great for VHF. So the home computer, a TRS80 MC10, was put to use to learn Morse for the 10 WPM upgrading licence test. A program called *Hamcode* was found in the book *TRS80 Colour Computer Programs*. This was typed in, the unnecessary punctuation characters being removed, and used each day to practice. The 80 metre Slow Morse Broadcasts (on 3.550 MHz, from VK2, from 1930-2030 and VK5, 2030-2130 UTC), were used a couple of times, but at my location and on my untuned piece of wire for an antenna, the signals were noisy and faded out most of the time. (It was not until later when I actually got the full call that the station and antenna were improved, along with the signals!).

There seemed to be no speed standard and tapes all had their own characteristic rhythm and speed.

The program has a variable called T to change the speed and as my Morse speed improved, T was reduced to reduce the space between the characters. I modified the program to send random five letter groups continuously.

Some Morse tapes from various sources, mainly copied from tapes used by other full calls also provided practice while driving to work, but one thing worried me. This was the fact that there seemed to be no speed standard and the tapes all had their own characteristic rhythm and speed — therefore I did not know what to expect in the exam. Unlike serial computer data, where you know that at 300 Baud the bits are all exactly 3.33 mS long, nothing seemed to be written about a standard for Morse speed. I simply changed T on the Morse program so that I got 250 random characters in five minutes and assumed that this represented 10 five letter words per minute.

After about three months of practice exam-time came around. The receiving was a nightmare. I had never heard Morse like this before; all dashes and long dashes. (The letter "S" sounded like an "O" for example). The practice session was not long enough to re-adjust my brain. The sending was easy with the message being rattled out with 29 seconds to spare, and this was after only about one hour of practice using a key beforehand.

I acquired a tape and proceeded to analyse it on a digital storage oscilloscope.

Less than one week before the exam, I heard about the Morse Classes run by the WIA and I phoned the class instructor, Ron Cannon. He said he could send me a copy of a Department

```
5 REM:HAM8
9 N=20000
10 POKE N,79:POKE N+1,151:POKE N+2,3
15 POKE N+3,134:POKE N+4,65
20 POKE N+5,189:POKE N+6,78:POKE N+7,64:POKE N+8,74:POKE N+9,38
21 POKE N+10,250:POKE N+11,134:POKE N+12,1:POKE N+13,151
22 POKE N+14,3:POKE N+15,57
25 POKE N+16,79:POKE N+17,151:POKE N+18,3
30 POKE N+19,134:POKE N+20,159
35 POKE N+21,189:POKE N+22,78:POKE N+23,64:POKE N+24,74:POKE N+25,38:POKE N+26,2
50:POKE N+27,134
36 POKE N+28,1:POKE N+29,151:POKE N+30,3:POKE N+31,57
40 POKE N+32,198:POKE N+33,255:POKE N+34,90:POKE N+35,1
41 POKE N+36,38:POKE N+37,252:POKE N+38,57
90 CLS
120 GOTO 2000
130 W=ASC(R$)-39:IF W<0 OR W>51 THEN 220
140 T$=C$(W):IF T$>"/" THEN 220
150 FOR J=1 TO LEN(T$):W$=MID$(T$,J,1)
160 IF W$="." THEN EXEC 20000
161 IF W$="-" THEN EXEC 20016
190 FOR D=1 TO 45:NEXT
200 NEXT:FOR J=1 TO 73*T:NEXT
210 RETURN
220 SOUND 8,8:RETURN
250 FOR K=1 TO LEN(P$):P$=MID$(P$,K,1)
260 IF ASC(R$)=32 THEN 280
270 GOSUB 130:NEXT:RETURN
280 FOR J=1 TO 558:NEXT
290 NEXT:PRINT:RETURN
300 PRINT"PRESS A KEY TO HEAR"
310 R$=INKEY$:IF R$="" THEN 310
320 W=ASC(R$):IF W=21 THEN 2100
330 IF W<39 OR W>90 THEN 350
340 IF C$(W-39)<>"X" THEN 360
350 SOUND 8,8:GOTO 310
360 PRINT R$;:GOSUB 130:GOTO 310
400 PRINT:PRINT"ENTER PHRASE"
410 INPUT P$
420 IF LEN(P$)=0 THEN P$=L$
430 IF P$="END" THEN 2100
440 GOSUB 250:L$=P$
450 GOTO 400
500 GOSUB 900
510 GOSUB 920
520 PRINT"WHAT CHARACTER IS THIS?"
540 GOSUB 130
550 T$=INKEY$:IF T$="" THEN 550
560 IF ASC(T$)=21 THEN 2100
570 IF ASC(T$)=13 THEN 540
580 PRINT T$:IF T$=R$ THEN 620
590 PRINT"NO, IT WAS ";R$
600 PRINT"TRY IT AGAIN.":PRINT
610 GOTO 510
620 PRINT"RIGHT!":GOTO 500
700 PRINT"WHAT'S THIS?"
710 P$="":FOR J=1 TO N
720 GOSUB 900
730 P$=P$+R$:NEXT
735 FOR J=1 TO 400:NEXT
740 GOSUB 250:PRINT" ";
741 PRINT P$;
746 GOTO 710
750 INPUT T$:IF T$="" THEN 740
760 IF T$="END" THEN 2100
770 IF T$=P$ THEN PRINT"RIGHT!":GOTO 700
780 PRINT"NO, IT WAS ";P$
790 PRINT"LISTEN AGAIN."
800 GOTO 740
900 R=RND(52)-1
901 IF C$(R)="X" OR C$(R)="-.-.-" OR C$(R)=".-.-." THEN 900
910 R$=CHR$(R+39):RETURN
920 FOR J=1 TO 800:NEXT:RETURN
950 END
2000 CLEAR 360
2010 DIM C$(51)
2020 FOR J=0 TO 51:READ C$(J):NEXT
2030 P=176:T=5
2050 CLS:P$="HAM CODE"
2060 PRINT TAB(12);P$:PRINT
2070 GOSUB 250
2080 N=5:L$=CHR$(32)
2100 PRINT
2110 PRINT:PRINT"**OPTIONS**"
2120 PRINT"1  LEARN CHARACTERS"
2130 PRINT"2  LEARN PHRASES"
2140 PRINT"3  SINGLE CHARACTER QUIZ"
```

```
2150 PRINT"4  MULTI CHARACTER QUIZ"
2160 PRINT"5  END"
2190 PRINT"ENTER 1-5"
2200 PRINT
2210 R$=INKEY$:R=RND(J)
2220 IF LEN(R$)=0 THEN 2210
2230 R=VAL(R$):IF R<1 OR R>5 THEN 2210
2240 ON R GOTO 300,400,500,700,950
3010 DATA X,-,-,-,-,-,X,X
3020 DATA X,X,X
3030 DATA X,-----,----
3040 DATA ..---,...--,...-
3050 DATA .....,-....,--...
3060 DATA ---..,----.,X
3070 DATA X,X,X,X,X,X
3080 DATA .-,-...,-.-.,-...
3090 DATA ..-.,--.,.....,...---
3100 DATA -.-,-..,--,-.,---
3110 DATA .--.,--.-,-.....,-
3120 DATA ..-,...-,.--,-..-
3130 DATA -.--,--..
```

Morse Program.

of Communications 10 WPM tape, but would not have one ready until the following week. Anyway, not to be defeated by the exam, I purchased a tape and proceeded to analyse it on a digital storage oscilloscope. Here are the results of the time periods which readers may want to use in their own computer programs:

DOC Standard 10 WPM

dot	130 mS
dash	320 mS
gap between dots and dashes	60 mS
gap between letters	460 mS
gap between words	1020 to 1120 mS (1040 mS typical)

The tone frequency of the DOC tape was 785 Hz with some second harmonic component. The frequency is not so important as the ear can readily adapt to changes in pitch without affecting the decoding of the characters. At first glance, the above durations seem too long to give 10 WPM, but apparently the reason for this is that statistically plain text does not make use of all letters of the alphabet with uniform frequency and those with the highest frequency have the least number of dots or dashes. For further information on this subject see *Did Morse get it right?* in *Wireless World*, August 1983. Also in the exam, numbers each count as two letters. Note too, that DOC quote their examination speed as consisting of 12 WPM characters spaced out to an effective 10.

There was no way to modify the program using the sound command.

The Morse characters, I discovered, were actually coming out at 19-20 WPM on my computer with excessive spacing between them. The computer dots and dashes are actually generated by the Micro Colour Basic command *Sound P,D* where P is the pitch and D is the duration. Both P and D are integers from one to 255. D=1 is used for a 75 mS dot and D=3 for a 225 mS dash, much shorter than the DOC's 10 WPM.

Unfortunately there was no way to modify the program using the *Sound* command (which comes out of the speaker of the monitor television) to make the periods the same as the DOC standard. However, I wrote a simple machine language program to output the dots and dashes of exactly the right durations from the serial in/out port of the computer. Although not as convenient as the television, the output is "cleaner" as the television audio output envelope tended to be rather "ragged." The serial output is then used to gate on and off a simple audio oscillator which is used to drive either headphones, speaker or tape recorder for recording practice sessions.

Although the MC10 is not a particularly common computer, the program is listed because the *Microsoft Basic* program will work on many computer types with slight modification to the delays, the machine language program is also listed separately to give the procedure used.

DESCRIPTION OF BASIC PROGRAM

The machine language program is poked into memory by lines 10 to 41, starting at a convenient address of 20000 given in line 9. Data lines are normally used for entering machine code but this method is already used in lines 3010 to 3130, for entering the dots and dashes look-up the table.

Lines 130 to 220 outputs character R$. Lines 250 to 290 outputs phrase P$. Lines 300 to 360 teach characters by echoing keys until "Control-Q" is pressed.

Lines 400 to 450 teach phrases by echoing entries until END is entered. Lines 500 to 620 quizzes individual characters until "Control-Q" is pressed. Lines 700 to 800 quizzes random five character phrases until END is entered. Lines 900 to 910 pick random character R$.

Line 190 gives the delay between dots and dashes, line 200 gives the delay between letters. Line 280 provides the delay between words in Option 2 and line 735 for Option 4. The numbers in these lines may be varied for other computers to obtain the correct delays on the storage CRO.

DESCRIPTION OF MACHINE LANGUAGE SUBROUTINE

The first task in adapting this to other computers is to find the address of the serial printer output. In my case, this was Bit0 of address 03. Next a table of the instruction codes for your particular computer's micro-processor is required. In my case, an MC6803 (which is the same as an MC6801 operating in Modes 2 or 3).

To output the start of a dot or dash, a "zero" is outputted to address 03 by the instructions *CLRA* (clear accumulator A) and ***STAA 03*** (store contents of accumulator A in address 03). To give the dot or dash the correct time period, a delay loop is used. A number (255) is loaded into accumulator B and decremented by one each time around the loop until it reaches zero. The decrementing, *DECB*, instruction takes two clock cycles of the micro-processor, a NOP or no-operation, takes two cycles and the branch, if not equal (BNE) takes three clock cycles. The "branch if not equal" in this case means equal to zero. A branch back to label CCC is four program steps giving the number 252, which is 256 minus four. Each clock cycle takes 1.124 uS because the micro-processor runs off a 0.89 MHz crystal. The *Delay* subroutine then gives a delay of 7*255*1.124 uS or 2.01 mS.

To get a dot the *Delay* subroutine is executed 65 times and for a dash 159 times. The *Delay* subroutine is executed each time *JSR Delay* is encountered (jump to subroutine). The address of *Delay* is 20032, which is given by the two Bytes of instruction code 78,64 in decimal. This is 4E,40 in hexadecimal and since E=14, corresponds to
4*4096+14*256+4*16+0*1 = 20032.

To end the dot or dash, bit0 of address 03 is put to a logic 1 by the instructions LDA #1, STAA 03. Note that a "1" output from the microprocessor turns off the tone in the

MACHINE LANGUAGE SUBROUTINE.

ADDRESS	INSTRUCTION (in decimal)	LABEL	MNEMONIC		COMMENT
20000	79	DOT	CLRA		
	151,3		STAA	03	OUTPUT START OF DOT
	134,65		LDA	#65	
	189,78,64	DDD	JSR	DELAY	DELAY=65*2.01
	74		DECA		=130mS
	38,250		BNE	DDD	
	134,1		LDA	#1	
	151,3		STAA	03	END OF DOT
	57		RTS		
20016	79	DASH	CLRA		
	151,3		STAA	03	OUTPUT START OF DASH
	134,159		LDA	#159	
	189,78,64	EEE	JSR	DELAY	DELAY=159*2.01
	74		DECA		=320mS
	38,250		BNE	EEE	
	134,1		LDA	#1	
	151,3		STAA	03	END OF DASH
	57		RTS		
20032	198,255	DELAY	LDB	#255	DELAY=7*255*1.124uS
	90	CCC	DECB		2 (=2.01mS)
	1		NOP		2
	38,252		BNE	CCC	3
	57		RTS		7 CLOCK CYCLES.

Machine Language Subroutine.

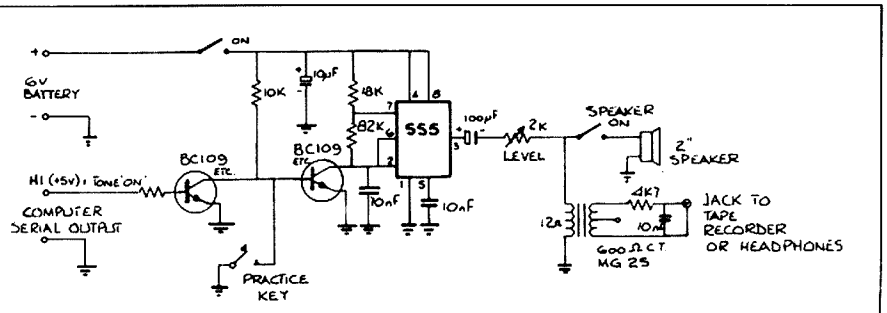


Figure 1 — The External oscillator.

external oscillator because there is an inverter driving the serial output inside the computer. The instruction *RTS* (return from subroutine) causes the program to go back to the Basic program after the dot or dash is complete. The Basic instruction *EXEC* in lines 160 and 161 cause the computer to execute the machine language instructions starting at the address given.

USING THE PROGRAM

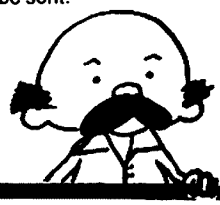
I found that once the characters have been learned using Option 1, the main use of the program for practicing alone is Option 4. Here random five letter and number groups are sent. The television screen is covered up and the characters written down. After say 50 groups are copied, the program may be stopped by pressing *Break* and the written work corrected. Another useful feature is Option 2, where you can get your wife to type in four lines from a book, etc, and the message put on tape to provide new plain language practice material. I was limited to only four lines with 4k of memory. With more memory the number in line 2000 could be increased to give more string space. By typing "opening bracket, space" at the start of the message, and "closing bracket, space" at the end of the message, (and), the commencing signal dah-di-dah-di-dah and ending signal di-dah-di- dah-dit will be sent.

The external oscillator is something I threw together on a piece of matrix board. The 555 is wired as an astable oscillator. The transformer eliminates any possible earth hum loops for the tape recorder input. The current drain is about 3 mA on standby and 15 mA keyed.

On the subject of Morse examinations, I found the articles in previous *Amateur Radios* very useful. (*That terrible five minutes* April 1984, and *Pounding Brass* February 1984). Some differences I found sitting the exam in Melbourne (at Camberwell) is that for the receiving exam there are two long benches with the audio fed down each via a cable. There are junction boxes every couple of metres which you plug the headset into. You can take your own comfortable headset but it must have a standard quarter-inch mono plug. If you use a stereo plug you only get sound in one ear. It also pays to have all your height, weight, etc, information handy as this must be written on the front of the examination paper.

In conclusion, I can say that practicing on nothing else but the DOC standard speed and trying to get down to zero errors consistently, I found that the examination was no trouble with no characters being missed that I know of, which was a great improvement on my first attempt.

ar



PUBLICATION OF COMPUTER PROGRAMS

Part of the technical editing of computer programs involves running the program. This has meant re-typing it from a listing supplied from the author. Many hours are spent by the editors entering the program, especially if, as does often occur, syntactical errors are introduced.

In future, to overcome this hold-up, alternative forms of program entry may be required; eg cassette, disk, or via a modem. This will enable quick editing. If we do require the program in one of these alternative forms, we will provide the blank cassette, disc, etc, or make the telephone call in the case of modems.

Finally, a word of advice. Computer programs on their own do not make good articles. Please include with any program a description of your algorithm. Articles are much more interesting when they include, not just a description of the **how** but also the **why**. Please use your blackest ribbon for your print-out.

use your IBM PC/XT (or clone) for RTTY

Bryon Dunkley-Smith VK3YFL
17 Chesney Drive, Ringwood, Vic. 3134

Computers are becoming common-place in homes these days, particularly in the homes of amateur radio operators.

The IBM PC/XT has become an industry "standard" and with many other manufacturers producing low cost "clones" of these machines, this machine has been chosen by many for home use also.

Many communications software packages exist for the XT family, but most cater only for information transmission using the ASCII format with seven or eight data bits at speeds ranging upwards from 50 Baud. The "standard" for RTTY transmission in Australia is the Baudot code which uses five data bits at a speed of 45.45 Baud.

Therefore, in order to use the XT family for RTTY a specialty communications package has to be purchased or written by the user.

The accompanying program listed here is written in 8088 Assembly language and is designed to allow the XT to operate as a full duplex teleprinter utilising the main serial port. It is a simple program which does not include fancy features like split screens, type ahead facilities or automatic transmitter control, however, it is a program which may be used immediately or used as the basis of a program with more features. It does provide for the generation of hard copies by entering ^P to toggle the printer on and off as the ^P DOS command does and also automatic transmission of a CR/LF combination on entry of a ⟨RETURN⟩ from the keyboard or after the entry of 64 characters on a line, thus allowing typing of text to proceed continuously.

For those unfamiliar with Assembly language, the listing shown should be entered as a text file with the file name extension .ASM; eg RTTY.ASM using EDLIN, WORDSTAR (non-document mode) or your favourite text editor, and then assembled using ASM.EXE or MASM.EXE (as supplied on the DOS disk) to produce an object code file; eg RTTY.OBJ. This must then be processed by Link.EXE to produce the executable file; eg RTTY.EXE.

NOTE: Since completing this article the author has developed the program further to indicate split transmit and receive screens, together with a transmit "type ahead" buffer. As the source code is too long to reproduce in AR he would be happy to supply the code to readers who supply a disk together with return postage or by phoning (03) 876 2686 using Christensen Protocol at 300 Baud.

ar

```
STACK   SEGMENT STACK
        DW      64 DUP(?)
STACK   ENDS
SERIAL  EQU     03F8H
PRINTR  EQU     03BCH
CODE    SEGMENT
RXFLAG  DB      0               ;Define RX FIGS/LTRS flag
TXFLAG  DB      0               ;Define TX FIGS/LTRS flag
PTFLAG  DB      0               ;Define printer flag
CURSOR  DB      1               ;Define cursor column pos'n
BUFFER  DB      256 DUP(0)      ;Define print buffer
PNT1    DB      0               ;Define buffer print pos'n
PNT2    DB      0               ;Define buffer input pos'n
MSG     DB      25 DUP(10)
        DB      '               45.45 baud RTTY Baudot routine enabled',10,13,1
0,10,10
        DB      '             Code written by Bryon Dunkley-Smith (VK3YFL)',10,1
3,10,10,10
        DB      '                 Press  ESC  to return to DOS',10,13,10,10
        DB      '               Press  P to toggle printer on/off',10,13,10,1
0,'$'
        ASSUME  CS:CODE,DS:CODE
RTTY    PROC    FAR
        PUSH    DS              ;Save segment of PSP
        MOV     AX,0
        PUSH    AX              ;Save offset of 0 on stack
        MOV     AX,CS
        MOV     DS,AX
        MOV     DX,SERIAL+3     ;Control register
        MOV     AL,80H
        OUT     DX,AL           ;Set up for divisor
        MOV     AX,0525         ;Divisor for 45.45 baud
        MOV     DX,SERIAL
        OUT     DX,AL           ;Low order of divisor
        MOV     AL,AH
        INC     DX
        OUT     DX,AL           ;High order of divisor
        MOV     DX,SERIAL+3     ;Control register
        MOV     AL,00000010B    ;Sets no parity, 2 stop & 5 data bits
        OUT     DX,AL
        MOV     AH,9            ;Set up to display message
        MOV     DX,OFFSET MSG
        INT     21H
NOCHAR: MOV     AH,1            ;Test keyboard
        INT     16H             ; status
        JNZ     LBL1
        JMP     NOKEY           ;Jump if no key depressed
LBL1:   MOV     AH,0            ;Input char
        INT     16H             ; from keyboard
        CMP     AL,1BH          ;Check for ESC
        JNZ     NOEXIT
        RET                     ; and return to DOS
NOEXIT: CMP     AL,0DH          ;Check for CR
        JNZ     NOCR            ; and jump
        CALL    CRLF            ;Send and display CR/LF
        JMP     NOKEY
NOCR:   CMP     AL,10H          ;Test for ^P
        JNZ     NOCTLP          ; no - jump
        ADD     PTFLAG,1        ; yes - toggle flag
        JMP     NOKEY
NOCTLP: CALL    VIDEO           ;Display char on screen
        INC     CURSOR          ;Increment cursor position
        CMP     CURSOR,64       ;Check if cursor OK
        JLE     CUROK           ;Jump if OK
        CALL    CRLF            ;Send and display CR/LF
CUROK:  MOV     BX,OFFSET TABLE1
        XLAT    TABLE1          ;ASCII to Baudot
        TEST    AL,40H          ;Test for FIGS or LTRS
        JZ      LTRS1           ;FIGS Z=0,LTRS Z=1
FIGS:   PUSH    AX              ;Save char
        MOV     AL,1
        JMP     COMP            ;Jump to compare with previous shift
LTRS1:  PUSH    AX              ;Save char
        MOV     AL,0
COMP:   MOV     AH,TXFLAG       ;Load with previous shift
        CMP     AH,AL           ; and compare with new shift
        JZ      NSHIFT          ;Jump to NSHIFT if AL=TXFLAG
        MOV     AH,0
        CMP     AH,AL           ;Test for LTRS
        JZ      LTRS2           ;Jump if LTRS
        MOV     AL,1BH          ;Send
        CALL    SEND            ; FIGS shift
        MOV     TXFLAG,1        ;Set TXFLAG for FIGS
        JMP     NSHIFT
LTRS2:  MOV     AL,1FH          ;Send
        CALL    SEND            ; LTRS shift
        MOV     TXFLAG,0        ;Set TXFLAG for FIGS
NSHIFT: POP     AX              ;Restore char
        CALL    SEND            ;Send char
NOKEY:  MOV     DX,SERIAL+5     ;Test
        IN      AL,DX           ; for
        TEST    AL,01H          ; char
        JNZ     LBL2
        JMP     PRINT           ;Jump if no char
LBL2:   MOV     DX,SERIAL       ;Get
        IN      AL,DX           ; char
        CMP     AL,1BH          ;Compare with FIGS shift
        JNZ     LTRS0           ;Jump if not FIGS shift
        MOV     RXFLAG,1        ;Set RXFLAG for FIGS shift
        JMP     NOKEY
LTRS0:  CMP     AL,1FH          ;Compare with LTRS shift
        JNZ     CONV            ;Jump if not LTRS shift
        MOV     RXFLAG,0        ;Set RXFLAG for LTRS shift
        JMP     NOKEY
CONV:   ADD     AL,AL           ;Double char
        ADD     AL,RXFLAG       ;Set for FIGS or LTRS
        MOV     BX,OFFSET TABLE2
        XLAT    TABLE2          ;Baudot to ASCII
        CALL    VIDEO           ;Display char
PRINT:  MOV     AL,PNT1         ;Load buffer print pos'n
        MOV     AH,PNT2         ;Load buffer input pos'n
        CMP     AL,AH           ;Check if current
        JE      PASS            ; and pass if so
        MOV     BX,OFFSET BUFFER;Point to print buffer
        XLAT    BUFFER          ;Fetch char from buffer
        MOV     DX,PRINTR       ;Data output port
        OUT     DX,AL           ;Put char in output port
        INC     DX              ;Status port address
        IN      AL,DX           ;Get printer status
        TEST    AL,80H          ;Test the bus. bit
        JZ      PASS            ; and pass if busy
        INC     DX              ;Point to control port
        MOV     AL,0DH          ;Control value for strobe high
        OUT     DX,AL
        MOV     AL,0CH          ;Control value for strobe low
        OUT     DX,AL
        ADD     PNT1,1          ;Bump to next buffer loc'n
PASS:   JMP     NOCHAR          ;Check for TX char
RTTY    ENDP
```

```
TABLE1  DB      00H,00H,00H,00H,00H,00H,00H,00H,00H,00H,02H,00H
        DB      00H,08H,00H,00H,00H,00H,00H,00H,00H,00H,00H,00H
        DB      00H,00H,00H,00H,00H,00H,00H 00H,04H,00H,45H,00H
        DB      54H,4DH,00H,45H,4FH,52H,00H,51H,4CH,43H,5CH,5DH
        DB      56H,57H,53H,41H,4AH,50H,55H,47H,46H,58H,4EH,00H
        DB      00H,5EH,00H,59H,5AH,03H,19H 0EH,09H,01H,0DH,1AH
        DB      14H,06H,08H,0FH,12H,1CH,0CH,18H,16H,17H,0AH,05H
        DB      10H,07H,1EH,13H,1DH,15H,11H,4FH,5DH,52H,00H,43H
        DB      00H,03H,19H,0EH,09H,01H,0DH,1AH,14H,06H,08H,0FH
        DB      12H,1CH,0CH,18H,16H,17H,0AH,05H,10H,07H,1EH,13H
        DB      10H,15H,11H,4FH,4EH,52H,00H,00H
TABLE2  DB      0,0,'E','3',10,10,'A','-',' ',' ','S','"'
        DB      'I','8','U','7',13,13,'D','+','R','4','J',7
        DB      'N',',','F',0,'C',':','K','(','T','5','Z','+'
        DB      'L',')','W','2','H','/','Y','6','F','O','Q','1'
        DB      'O','9','B','?','G','-',0,0,'M',',','X','/'
        DB      'V','=',0,0
VIDEO   PROC    NEAR                    ;Video display sub-routine
        CALL    PBUFF                   ;Jump to printer sub-routine
        MOV     AH,14                   ;Display
        MOV     DX,0                    ; char
        MOV     BX,0                    ; in AL
        INT     10H                     ; on screen
        RET
VIDEO   ENDF
SEND    PROC    NEAR                    ;RS232 Send sub-routine
        PUSH    AX                      ;Save char
        MOV     DX,SERIAL+5             ;Test
LBL3:   IN      AL,DX                   ; TX buffer
        TEST    AL,20H                  ; for empt,
        JZ      LBL3
```

```
        POP     AX                      ;Restore char
        MOV     DX,SERIAL
        OUT     DX,AL                   ;Send char
        RET
SEND    ENDP
PBUFF   PROC    NEAR                    ;Printer buffer sub-routine
        TEST    PTFLAG,1                ;Printer flag set ?
        JZ      RETN                    ; no - jump to return
        MOV     BH,0
        MOV     BL,PNT2
        ADD     BX,OFFSET BUFFER;Point to buffer loc'n
        MOV     [BX],AL                 ;Store char in buffer
        ADD     PNT2,1                  ;Bump to next buffer loc'n
RETN:   RET
PBUFF   ENDP
CRLF    PROC    NEAR                    ;CR/LF sub-routine
        PUSH    AX                      ;Save char
        MOV     AL,0DH                  ;Send
        CALL    SEND                    ; CR
        MOV     AL,0AH                  ;Send
        CALL    SEND                    ; LF
        MOV     CURSOR,1                ;Reset cursor pos'n
        MOV     AL,0DH                  ;Display
        CALL    VIDEO                   ; CR
        MOV     AL,0AH                  ;Display
        CALL    VIDEO                   ; LF
        POP     AX                      ;Restore char
        RET
CRLF    ENDP
CODE    ENDS
        END     RTTY
```

HOW WILL AMSAT PHASE IIIC ACHIEVE ITS ORBIT?

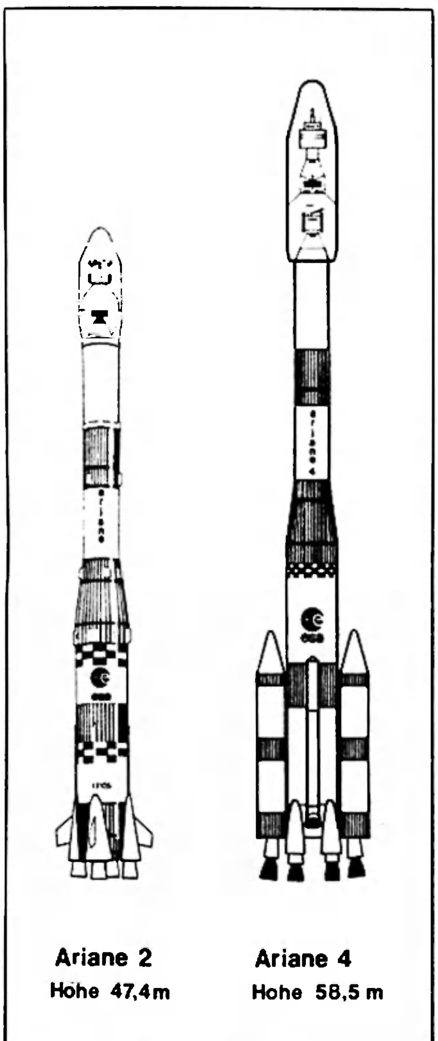


Figure 1 — Ariane 2 is 47.4 metres tall compared to Ariane 4 which is 58.5 metres.

Now that OSCAR-10 has functioned so reliably for two-and- a-half-years, another satellite launch *DL-SAT Phase 3C* is expected in Autumn 1986 (Spring 1986 in VK). This satellite is an improved follow-up version and is being constructed with substantial financial assistance by the Deutscher Amateur Radio Club (DARC) DM 250 000, and the West German Federal Ministry for Research and Technology DM 750 000.

OSCAR-10 was launched in June 1983 with an Ariane-2 rocket but the launching of DL-SAT Phase 3C is planned with a new European-Rocket Ariane-4 (see Figure 1). Ariane-4 is 11 metres taller than Ariane-2, and can carry a 4.2 ton payload to a sun synchronous 800 km high orbit. This is being achieved with four additional rocket motors (two using solid fuel and two using liquid).

Three payloads are planned for the October/November (?) 1986 launch. One further METEOSAT, a PANAMSAT (American Communications Satellite) and the Amateur Radio Satellite, Phase 3C. Figure 2 shows the separation sequence of the various payloads. Picture 6 of Figure 2 shows the cylinder X, which holds the DL-SAT Phase 3C. The actual size can be seen in Figures 3 and 4.

The cylinder X, with Phase 3C is an independent unit after separation. Since the satellite will be ejected later, a separation sequencer was required, which was developed and supplied by AMSAT-DL. This sequencer is attached to the cylinder X and not to the satellite. The timing of the sequencer commences after the separation of the cylinder X from the transport container (level W). The ignition of the separating bolts — holding the clamping belt — takes place 3600 seconds later. Phase 3C is then ejected from cylinder X by three springs on the clamping belt.

Next, the magnetic satellite orientation system within the satellite places it in the correct position (Magnet-Earth acts as reference), and the 400 Newton rocket motor of the satellite is ignited (see

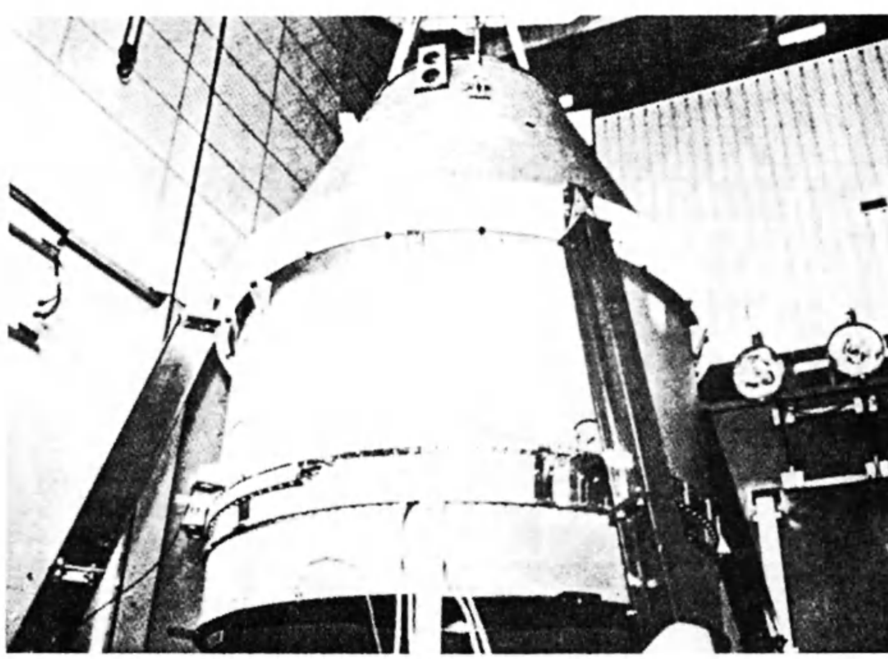


Figure 3.

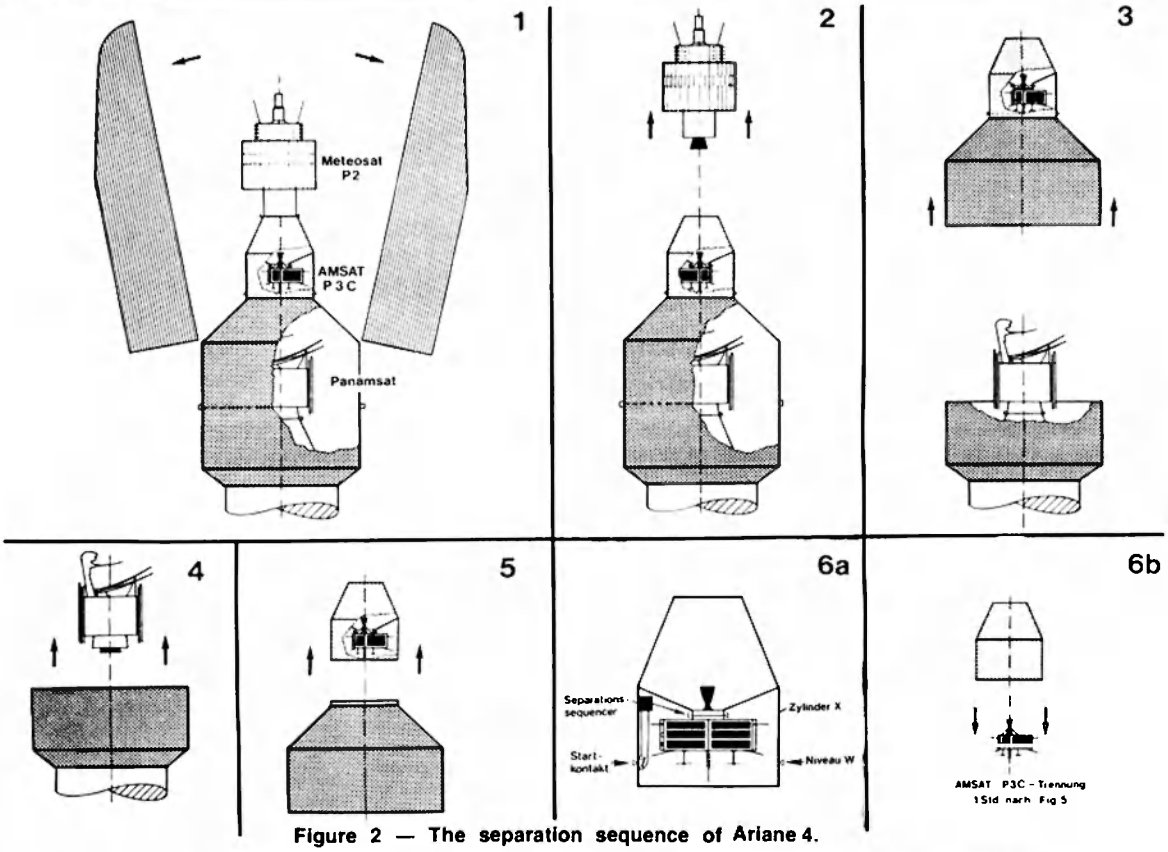
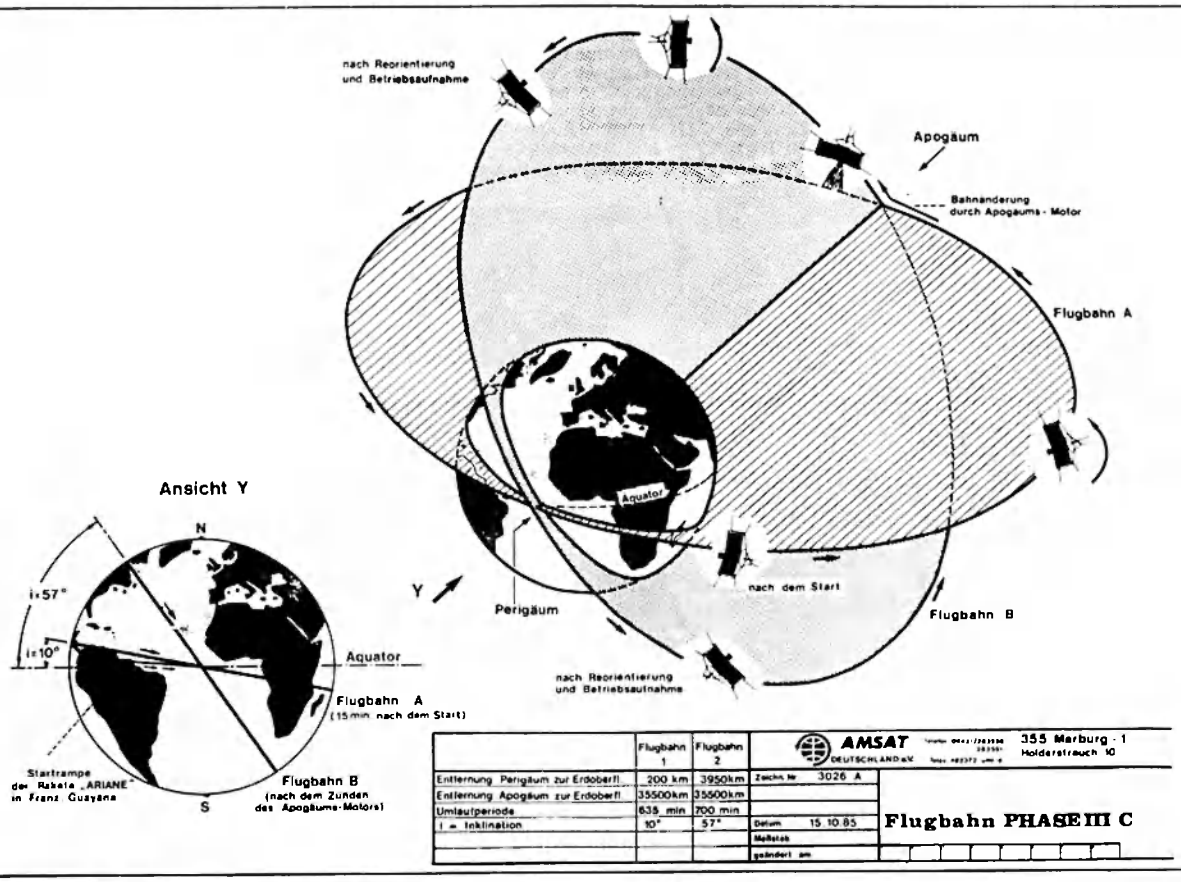


Figure 2 — The separation sequence of Ariane 4.

Figure 5.



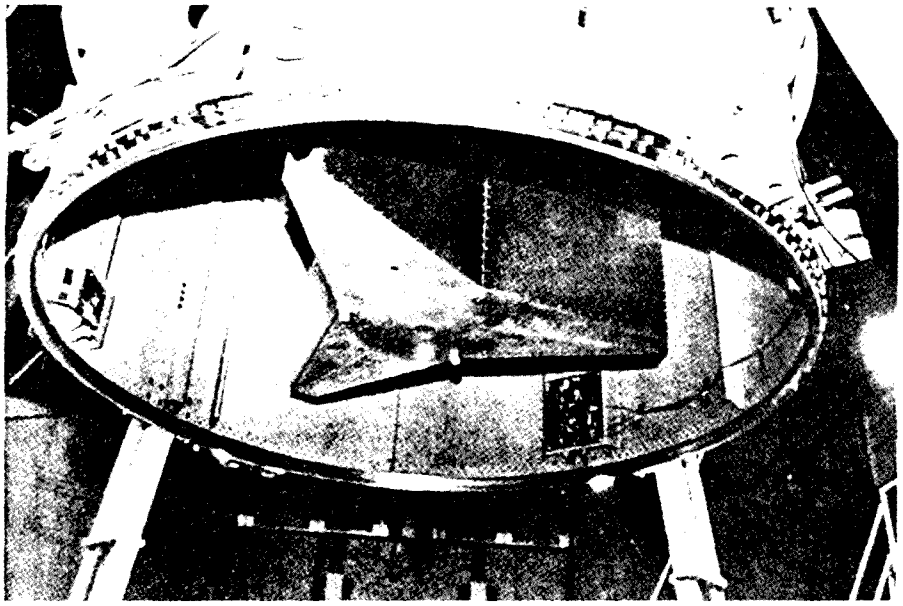


Figure 4.

Figure 5).

This operation changes the inclination of the satellite orbit to the equator and lifts the perigee (point of closest approach to earth).

An inclination of 57 degrees is desired because the majority of users live in the Northern Hemisphere. (This means less than five degrees antenna elevation for VK2 to Europe QSOs).

Also, the argument of the perigee changes little at 57 degrees inclination, resulting in a nearly unchanging satellite orbit over a long period of time. The transponders will be made operational after the re-orientation phase (to point the antennas towards earth).

This project will give amateur radio further possibilities of making world- wide contacts via satellite. The RUDAK-Project offers new interesting scope for conducting digital communication (packet radio) via satellite and to gain valuable experience with a new operation technique.

Reprinted from *CQ-DL*, March 1986. The original article was written by Werner Haas DJ5FQ and translated for *Amateur Radio* by Hans Ruckert VK2AOU

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An Antenna Length Chart

Here is a clip-and-save chart that will save you lots of time while helping you to put up a variety of antennas. This article originally appeared in CQ Magazine, March 1986 and was written by George I Wagner K5KG.

In the past few years I have had several opportunities to operate from a number of DX locations. In doing so, I have learned the importance of taking along the proper collection of tools, connectors, gadgets, and reference information to be able to make a quick repair or string up a needed antenna in an unfamiliar shack. Conversely, I have also learned the agony of lugging too much along, only to find it completely unnecessary and unused at the end of the trip.

The antenna length chart, which is the subject of this article, arose out of the need to have a convenient and ready reference, other than a weighty handbook, for measuring antenna lengths. This results from a number of experiences in trying to find a calculator, or a paper and pencil (typically in the dark and late at night), inevitable debates over what constants to use in the calculations, and finally the need to convert from feet to metres when only a metre tape was available, or vice versa. On two separate occasions I have discovered 160 metre dipoles of totally wrong lengths, and on an expedition to OJ0 in 1982, OH0RJ and I spent many hours calculating, cutting, and erecting 40 and 15 metre delta loops. This chart would have been a valuable asset in those circumstances.

This chart was developed after a brief reference to the various antenna handbooks in the shack, and a quick refresher on the current amateur frequencies, especially in the new 12, 15, and 30 metre WARC bands. The formulas used in the calculations, shown at the bottom of the chart, are based upon standard assumptions for wire antennas supported by end insulators.

The chart was developed using *Visicalc* (a registered trademark of *VisiCorp*), an electronic *spreadsheet* program on an *Apple II+* computer. However, any spreadsheet program on a personal computer could have been used to do the job.

It is not necessary to go into the details of using the spreadsheet program. I will point out, however, to those unfamiliar with such programs, that they provide a convenient way to manage rows and columns of numbers and text, and for performing rapid arithmetic calculations on the numbers. In this chart, for example, once the formulas and frequencies were input, the antenna lengths were quickly calculated for each of the eight columns. The first version of the chart did not include the new WARC bands. Once I realised this omission, it was quite easy with the spreadsheet program to insert the additional frequencies and recalculate the entire chart.

For the benefit of those new to amateur radio, the chart shows the proper wire lengths for antennas at each significant amateur frequency in the HF bands. In general, vertical antennas are ¼ wavelength high, dipoles are ½ wavelength long, and loops are one full wavelength in circumference. In addition, the chart shows the ½ wavelength plus five percent distance. This is used to find the length of a dipole erected in an inverted-Vee fashion.

For convenience and durability, I have had a copy of the chart laminated in plastic. The chart printed in this article can similarly be cut out and laminated.

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ANTENNA LENGTH CHART

FREQUENCY	WAVELENGTH — FEET				WAVELENGTH — METRES			
MHz	¼	½	½ + 5%	FULL	¼	½	½ + 5%	FULL
1.8	129.87	259.75	272.73	519.49	39.58	79.17	83.12	158.33
1.825	128.09	256.19	269.00	512.38	39.04	78.08	81.99	156.16
1.85	126.36	252.73	265.36	505.45	38.51	77.03	80.88	154.05
1.9	123.04	246.08	258.38	492.15	37.50	75.00	78.75	150.00
3.5	66.79	133.58	140.26	267.17	20.36	40.71	42.75	81.43
3.6	64.94	129.87	136.37	259.75	19.79	39.58	41.56	79.17
3.7	63.18	126.36	132.68	252.73	19.26	38.51	40.44	77.03
3.8	61.52	123.04	129.19	246.08	18.75	37.50	39.38	75.00
3.9	59.94	119.88	125.88	239.77	18.27	36.54	38.37	73.08
4	58.44	116.89	122.73	233.77	17.81	35.63	37.41	71.25
7	33.40	66.79	70.13	133.58	10.18	20.36	21.37	40.71
7.05	33.16	66.32	69.63	132.64	10.11	20.21	21.22	40.43
7.1	32.93	65.85	69.14	131.70	10.04	20.07	21.07	40.14
7.2	32.47	64.94	68.18	129.87	9.90	19.79	20.78	39.58
7.3	32.02	64.05	67.25	128.09	9.76	19.52	20.50	39.04
10	23.38	46.75	49.09	93.51	7.13	14.25	14.96	28.50
10.5	22.26	44.53	46.75	89.06	6.79	13.57	14.25	27.14
14	16.70	33.40	35.07	66.79	5.09	10.18	10.69	20.36
14.1	16.58	33.16	34.82	66.32	5.05	10.11	10.61	20.21
14.2	16.46	32.93	34.57	65.85	5.02	10.04	10.54	20.07
14.35	16.29	32.58	34.21	65.16	4.97	9.93	10.43	19.86
18	12.99	25.97	27.27	51.95	3.96	7.92	8.31	15.83
18.5	12.64	25.27	26.54	50.55	3.85	7.70	8.09	15.41
21	11.13	22.26	23.38	44.53	3.39	6.79	7.12	13.57
21.1	11.08	22.16	23.27	44.32	3.38	6.75	7.09	13.51
21.25	11.00	22.00	23.10	44.00	3.35	6.71	7.04	13.41
21.45	10.90	21.80	22.89	43.59	3.32	6.64	6.98	13.29
24.89	9.39	18.78	19.72	37.57	2.86	5.73	6.01	11.45
24.93	9.38	18.75	19.69	37.51	2.86	5.72	6.00	11.43
24.99	9.35	18.71	19.64	37.42	2.85	5.70	5.99	11.40
28	8.35	16.70	17.53	33.40	2.54	5.09	5.34	10.18
28.5	8.20	16.41	17.23	32.81	2.50	5.00	5.25	10.00
29	8.06	16.12	16.93	32.24	2.46	4.91	5.16	9.83

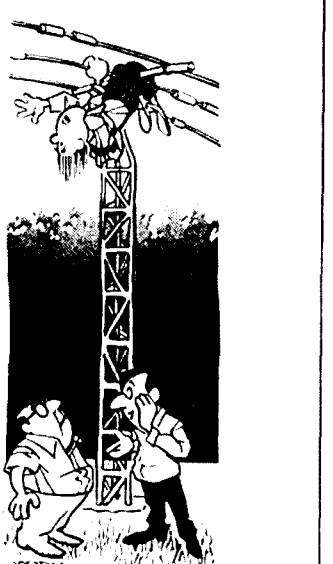
FORMULAS USED

1 metre = 3.281 feet

Length of ½ wavelength antenna in metres =
*(300 * .95 * .5)/ Frequency (MHz) = 142.50/Frequency (MHz)*

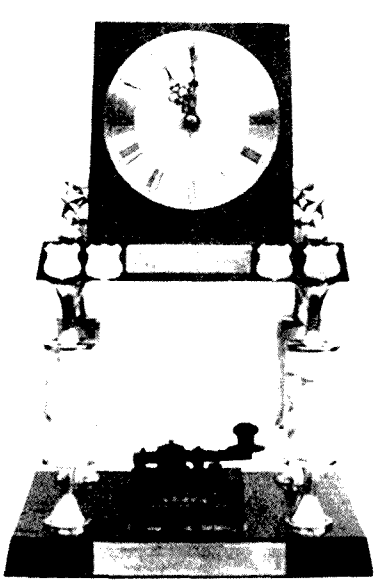
Length of ½ wavelength antenna in feet =
*(300 * .95 * .5 * 3.281m/feet)/ Frequency (MHz) = 467.54/Frequency (MHz)*

NOTE: ½ wavelength + 5% is used for Inverted Vee Antennas.



Cartoon courtesy *73 for Radio Amateurs*, March 1986

I'd help Ralph get down, but he's giving me a 1:1 SWR!



The Mrs McKenzie Trophy — see page 38 for the 1986 ALARA Contest rules.

1926 TRANS PACIFIC TESTS

During 1926, the WIA in Australia and the ARRL in America attempted to encourage interest between amateurs from both continents to see who could hear what and on which band. Following is the text of a letter written on a WIA letter-head by Ross Hull as Honorary Federal Secretary of the WIA, and also the information he supplied for amateurs.

Dear OM,

I am sending you the details of the big Trans Pacific tests which are being staged between May 23 and June 5. These tests will be the result of a long period of careful organising work with the American Radio Relay League, and I trust that you will do your part in showing the Americans that if no one else can be depended upon to co-operate with them in running a big test, the Australians certainly can.

When you have looked through the schedule I want you to send a card or radio to to the address above, stating the divisions of the tests in which you intend to be actively interested. On receipt of this information the necessary log sheets will be forwarded to you. In the case of transmitters entering in test A an official test message of 500 words will be forwarded in addition.

If you cannot take an active part in the tests, I would still like to have a card from you. The Federal Executive is anxious to know just how many transmitters are unable to take part in the test through stress of circumstances, and how many of them have died out from want of enthusiasm.

Yours sincerely,
Ross A Hull,
Hon Federal Secretary.

The Wireless Institute of Australia asks for your participation in what they hope will be the biggest organised amateur tests yet undertaken in any part of the world.

The Institute feels confident that the tests will have the full support of all real Australian experimenters, for it is in this work that they must demonstrate to the world at large the fact that they have not by any means been asleep during the three odd years that have elapsed since signals were first received from America.

What is perhaps more important is that the American amateurs in their enthusiastic old way are looking to the Australians to help them put up the finest performance that has yet been accomplished on this earth.

Just in case it may be thought in some quarters that there is no justification for the tests the chief aims and objects are outlined:

1. To demonstrate to the world at large the advanced stage of present day amateur radio *communication.*
2. To provide a much needed stimulus in amateur circles.
3. To drive home in the amateur world the existence of a pile of experimental work yet undone.
4. To discover the most reliable and effective amateur station in each of the Australian and American States.
5. To definitely establish the hours during which reliable communication can be maintained across the Pacific.
6. To provide further observations on the relative effectiveness of 20 and 40 metre bands for Trans Pacific working.
7. To stimulate interest in observations on waves as low as five metres.
8. To fill the air with signals of all shapes and sizes in order to show the short wave world that if no one else is alive the Australian amateurs are. (The latter point is being questioned in many quarters).

TEST A

Aim — To discover the most reliable and effective amateur station in each of the Australian and American States. Further, to provide a qualifying test for stations desirous of obtaining the Wireless Institute's "A grade amateur station" certificate.

Schedule — May 22 at 6 pm to June 5 at 6 pm.

1. Stations desiring to participate, upon applying to the Test Headquarters, will be provided with a passage of 500 words which must be transmitted to any station in America sometime during the total period of the tests.
2. An accurate log must be taken on the forms provided for the purpose of the transmissions necessary to send the test passage. The dates and exact times must be stated together with details of any repeats necessary and a statement whether single or double sending was used.
3. The full details of power used in the transmission must be included. Approximate plate potential and current, together with details of the valves used.
4. If it is desired to obtain an 'A grade amateur receiving and transmitting station" certificate or if it is desired to compete in the competition of this test, it will also be necessary to take an official 500 word test message from some American amateur station. The American station need not necessarily be the one to which the test message was transmitted.
5. Details of such reception must then be included on the log sheet together with a brief description of the receiver.
6. Stations not operating transmitters can forward a receiving log only. The reception of any one test message from America with an accuracy above 75 percent will entitle the operator to an Institute "A grade amateur receiving station."
7. All such logs and details must be forwarded to the test Headquarters before June 10.

It is hoped that a trophy will be awarded by each State Division of the Institute to the station whose performance is adjudged the best from all aspects amongst the stations in that particular state. The Federal Executive of the Institute will also award a trophy to the station making the best performance of all Australian participants.

8. The factors to be taken into consideration in judging this test will be:— The total time taken to transmit the message and the method and speed of keying, the power of the transmitter, the location of the station and all other information supplied by the station participating.
9. As in all activities of the tests the general working of the Australian stations will be listened to by several official observation stations.

TEST B

Aim — To establish definitely the hours during which reliable amateur communication can be maintained across the Pacific. Further, to gain detailed information as to the relative effectiveness of the 20 and 40 metre bands for Trans Pacific working.

Schedule — May 28 at 6 pm to May 29 at 6 pm; also June 4 at 6 pm to June 5 at 6 pm.

1. In order to accomplish something useful in this test it will be necessary for Australian and American stations on both 40 and 20 metre bands to be on the air during the whole 24 hours.
2. It will be very essential for more Australian transmitting stations to tune down to 20 metres than have done so to date, before any useful comparison work can be accomplished.
3. Arrangements will be left in the hands of the Federal Delegate of the Institute in your State to provide for at least one station on 20 and one on 35 metres to be on the air during the 24 hours. In addition to signifying your intention of interesting yourself in this particular test to Headquarters, you should therefore get into touch with the Federal Delegate in your State, who will arrange with you for your schedule.
4. If no transmitters can be on watch over the whole periods it is desirable that at least receiving stations be on the look out for American stations.
5. A report of any comparison work between signals on the 20 and 40 metre bands by any individual, during any time of these tests, is almost certain to be of value and will therefore be welcomed.
6. All logs of this particular phase of the tests should be posted to headquarters before June 10, in order that the summary of observations can be gathered from all reports and mailed to America without delay.

TEST C

Aim — To stimulate interest in observations on waves as low as five metres.

Schedules — May 26 from 6 pm to 10 pm; also June 2 same times.

A plea has been made by the ARRL for the greatest possible activity in America on wave lengths of the order of five metres during the time mentioned. The Institute is making the same plea in Australia and it can only be suggested that any experimenters with transmitters or receivers operating on approximately the wave length mentioned, should see that their stations are not inactive during the above periods. Should any positive results be achieved, even in working over short distances with other Australians engaged in calling America, full details of the working should be forwarded to Headquarters so that credit for any work can be correctly placed.

TEST D

Aim — To discover the Australian amateur station that can correspond with an American amateur station on three separate nights of the test period with the minimum total input power.

Schedules — Any three or more nights during the test period.

This "Miles per Watt" test is to be run on similar lines to the competition of that name at present in progress in America and being handled by the ARRL in conjunction with the Jewell Electrical Instrument Co.

The Australian representatives of the Jewell Company have donated a prize of a Solid Gold Fifteen Jewel Watch to be awarded to the amateur operator whose station establishes communication as mentioned above with the lowest total input power.

Complete details of the rules governing this competition are contained in a circular prepared by the Jewell representatives. This can be obtained by writing to Headquarters.

If you have any sort of a short wave receiving or transmitting station in operation send along your name and address on a sheet of paper with the numbers of the tests you will be particularly interested in, and complete log sheets and details will be sent.

All communications to be addressed to:

ROSS A HULL
Hon Federal Secretary
Wireless Institute of Australia. Box 3120P, GPO Sydney.

Contributed by Duane Foster VK2VE and Tim Mills VK2ZTM

The culminating occasion of these tests was the passing of 500 word messages in CW between the Australian and American stations. Those doing it successfully (over-heating of the "slop jar" power supplies was one problem), were awarded a fine certificate of about A4 size, which was signed by Hiram Percy Maxim, Phil Renshaw and the secretaries of the ARRL and WIA.

Do any Old Timers have any further information about these tests and particularly a list of participants?

Contributed by Dave Gray VK2IJ
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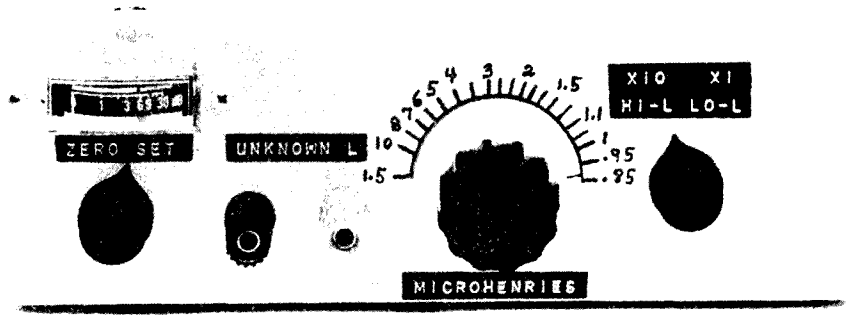
A TESTER FOR COIL INDUCTANCE

Laboratory-grade L and Q meters cost thousands of dollars. Let's build an inexpensive L and reiative-Q measuring unit for our amateur workshop.



How often have you been uncertain about the inductance of a home-made coil? There are times when we aren't sure of the core material we select from our parts supply — the cores *do* become mixed up on occasion and leave unanswered a question about the core permeability. Maybe we don't trust the A_L factor when winding a toroid and would feel more confident if we could measure the inductance of the completed coil. Those of you who are fortunate enough to have access to a Q meter need not worry about building a home-made test unit. But, for those frugal souls, like the writer, who can ill-afford $250 for an old, used Q meter, or a few thousand for a new Q and L tester, we can build a satisfactory unit for a few dollars.

Many of us have used alternative inductance-measuring methods since becoming amateurs. This entailed using fairly crude techniques, such as placing a known-value capacitor in parallel with an unknown inductance, then using a dip meter to find the resonant frequency. The two known factors could then be used to learn the inductance value by using the appropriate equations. Approximations were possible with these methods. But, many of our projects call for fairly precise inductance values, especially in fixed-tuned RF filters. So, we really need an instrument that can be used for measuring inductance directly. This eliminates time-consuming follow-up calculations or monitoring the dip-meter operating frequency with a calibrated general- coverage receiver.

CIRCUIT COMMENTARY

Figure 1 contains a schematic diagram that shows the circuit for our project. Provisions are made for two popular inductance ranges — 1-10 μH, and 10-100 μH. More ranges can be added. This is discussed later in the article.

Two oscillators are used in Figure 1. One operates on 2.5 MHz (10-100 μH range), and the other is on 7.9 MHz (1-10 μH range). C2 and C9 are critical values for establishing the proper amount of oscillator feedback. The X_C of these capacitors is 150 ohms. Tuned transformers are used at the collectors of Q1 and Q2. Each transformer is terminated by a 56-ohm resistor to provide a fixed oscillator load. Fundamental crystals are used at Y1 and Y2.

Operating voltage and the RF output for the oscillators is selected by range switch S1. RF voltage is routed to C6 (main tuning), J1 and J2 through a 6.8- pF coupling capacitor. This light coupling prevents the transformer secondary windings and load resistors from loading the coil under test, which could ruin the Q_u (unloaded Q) of the coil under test. This would cause low, broad- response meter readings. Light coupling (C8) is used between C6, J1 and J2 for routing the RF voltage to meter amplifier Q3. This helps to preserve the Q_u of the coil being tested.

A 2N4416 (Q3) serves as our meter amplifier. The word "amplifier" is a misnomer, since M1 indicates changes in FET current as the test coil is tuned to resonance by C6. As the tuning capacitor is adjusted for circuit resonance, the RF voltage at the gate of Q3 rises, and this increases the FET current. So perhaps a more descriptive name for the Q3 stage would be "current multiplier." By this I mean, we are *not* amplifying the RF-input signal.

A 10-megohm gate resistor is used at Q3 to help maintain the high gate impedance of the FET. For example, if we used a 0.1-megohm gate resistor, this would set the actual gate impedance at 0.1 megohm, and that would tend to load the test coil.

R1 sets the meter sensitivity, and R2 is adjusted to zero the meter when there is no coil connected to J1 and J2. It is likely that an MPF102 JFET could be used at Q3. I used a 2N4416 because I had some of them on hand, and did not wish to make a 100 km round trip to buy an MPF102 at the nearest radio store!

HARMONIC TRAPS ARE NEEDED

An interesting problem arose while I was testing the circuit of Figure 1: Two peak responses were observed on each range. One peak proved to be the desired one, and the spurious peak response took place when C6 was moved toward minimum capacitance. Investigation with my dip meter (wave-meter mode), when it was coupled to the test coil, showed a strong response at the second harmonic of each oscillator — 5 and 15.8 MHz! The test coil was being tuned to the second harmonic, which enhanced the harmonic currents present in each oscillator. The simple cure is to install a series-tuned trap at the secondary winding of T1 and T2 (L1, L2, C3 and C5). Alternatively, a half- wave, low-pass filter can be connected between the transformer secondary and C7 of Figure 1.

ADDITIONAL INDUCTANCE RANGES

We may add a tester range for 0.1 to 1.0 μH by including a third oscillator for 25-MHz operation. A suitable circuit is provided in Figure 2. An overtone type of oscillator is required, since fundamental crystals are not available for frequencies much above 20 MHz, Y1 of Figure 2 is a third-overtone crystal. A 50-MHz trap is used at the output side of T1. I tested the circuit of Figure 1 for use in this range by tuning the 7.9-MHz oscillator for third-overtone operation, and the results were good.

If you wish to cover the inductance range from 100 μH to 1 mH, you may include a fourth oscillator. It operates on 790 kHz. The circuit is given in Figure 3. This is a fundamental oscillator. The selectivity of T1 may be high enough at this frequency to preclude the use of a harmonic trap. I did not perform a test to determine if a trap was needed.

CONSTRUCTION NOTES

You may prefer to plan your own layout for the tester. The important matter is to keep the leads between the oscillator transformers (T1 and T2) and C7 as short as possible. Otherwise, use miniature RG-174 cable for the connecting leads. Similarly, the lead from C7 to C6 and J1 must be short. Again, keep the lead from C8 to Q3 short.

Figure 4 shows an interior view of my prototype unit. It reflects the "ugly construction" philosophy. Things were tacked together hurriedly in order to get the circuit operating. A finished model is planned.

The foundation for my tester is made from PC-board material. Double-sided PC stock was used for all but the front panel, which is made from single-sided board. The latter material was chosen to permit writing on the panel with an indelible marking pen. The copper around J1 of Figure 1 was ground away to a diameter of 100 mm to minimise stray capacitance to the copper foil.

R1 is a trimmer control that is soldered across the meter terminals. You may wish to use a panel-mounted control for R1.

M1 in my circuit is a 200-μA edgewise

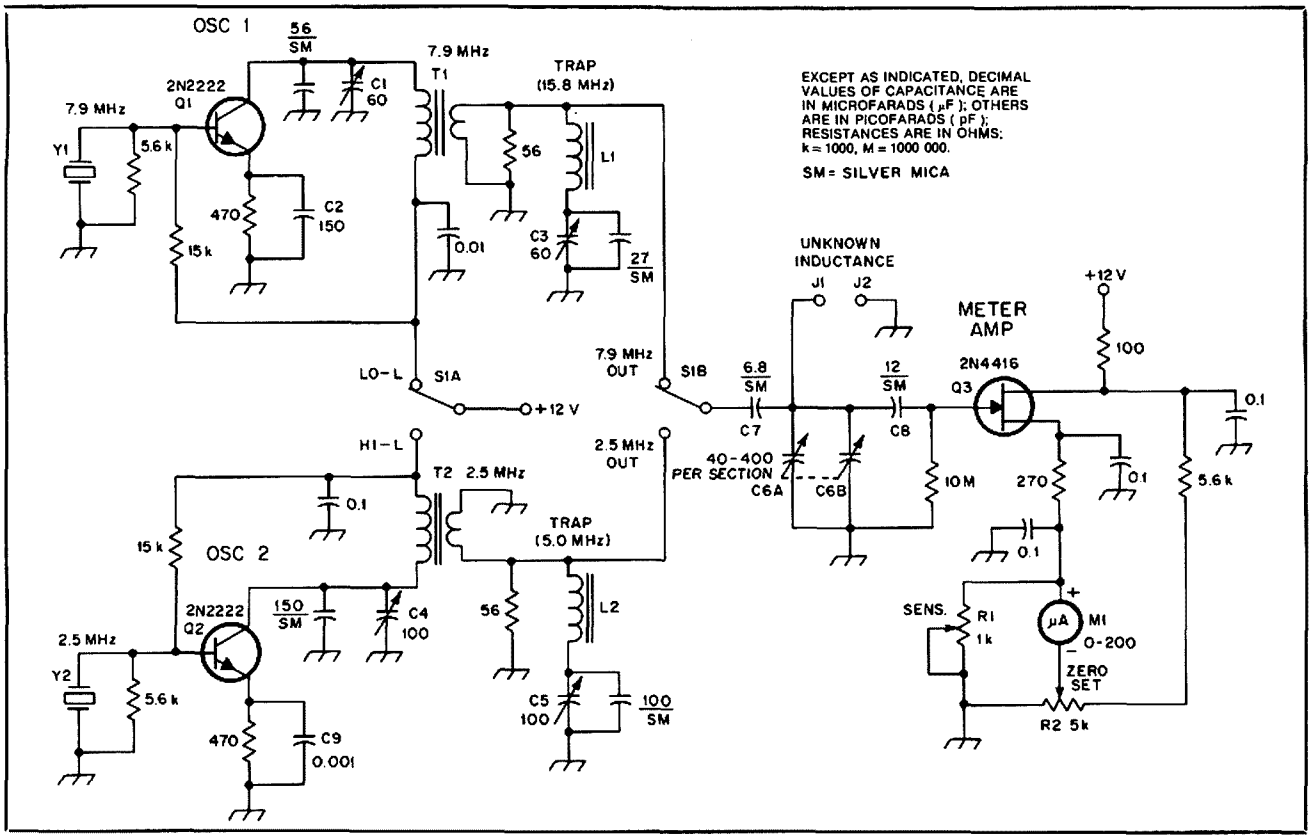


Fig 1—Schematic diagram of the two-range inductance checker. Fixed-value capacitors are disc ceramic or silver mica. Fixed-value resistors are ¼- or ½-W carbon composition.

C1, C3, C4, C5—Miniature ceramic, plastic or mica trimmer.
C2, C9—See text.
C8—40-400-pF variable (State Street Sales no. 68C96-5V or equiv).
J1, J2—Terminal post for banana plug.
L1—Toroidal inductor, 1.7 μH. 24 turns no. 26 enam wire on Amidon T37-6 toroid core.
L2—Toroidal inductor, 6.8 μH. 40 turns no. 30 enam wire on T37-2 toroid core.
M1—Miniature (or larger) 100- or 200-μA dc meter.
R1—PC-mount miniature 1-kΩ control (see text).
R2—Panel-mount 5-kΩ or 10-kΩ linear-taper, carbon composition control.
S1—DPDT toggle or wafer switch.
T1—Narrow-band transformer. 5-μH primary. 31 turns no. 26 enam wire on T50-2 toroid core. Sec has 7 turns of no. 26 wire.
T2—Narrow-band transformer. 20-μH primary. 19 turns of no 26 enam wire on Amidon FT37-61 (125 mu) toroid. Sec has 4 turns.
Y1, Y2—Fundamental crystal, 30-pF load capacitance. International Crystal Mfg Co, type GP.

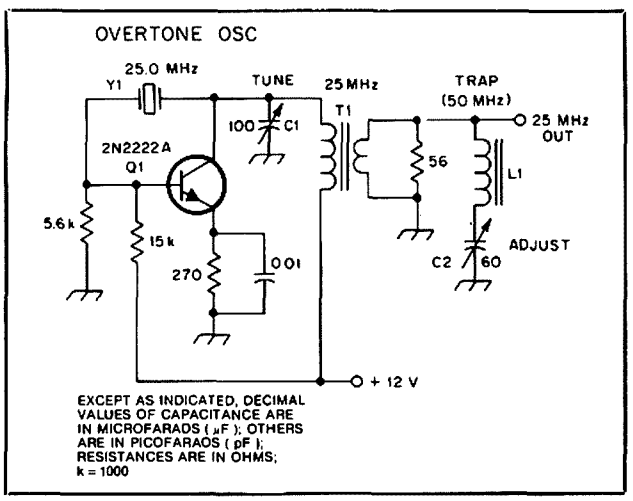


Fig 2—Schematic diagram of a 3rd-overtone oscillator for measuring inductances from 0.1 to 1.0 μH (see text). C1 and C2 are small mica, plastic or ceramic trimmers. L1 is 0.34 μH. Use 12 turns no. 26 enam wire on Amidon T37-10 toroid. T1 primary is 0.6 μH. Use 15 turns of no. 26 enam wire on T37-10 toroid core. Use 3 turns for sec. Y1 is a 3rd-overtone, 30-pF load capacitance crystal.

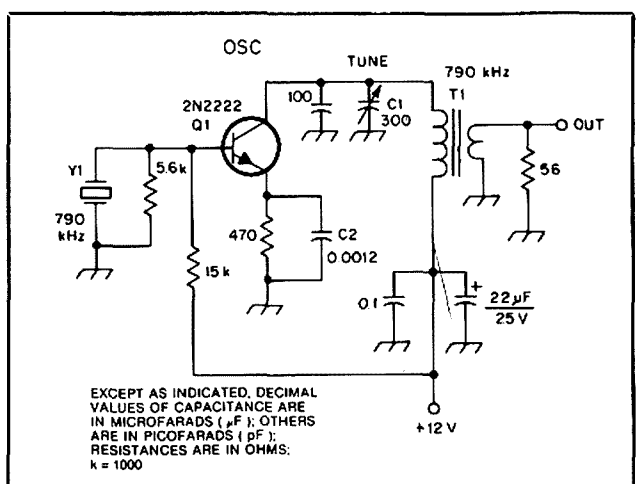


Fig 3—Circuit for a low-range oscillator (100 μH-1.0 mH). C1 is a mica trimmer. T1 primary is 135 μH. Use 45 turns of no. 26 enam wire on Amidon FT50-61 ferrite toroid. Sec has 10 turns. C2 is a feedback capacitor. The value may require adjustment to ensure reliable oscillator starting, depending upon the activity of the crystal used at Y1.

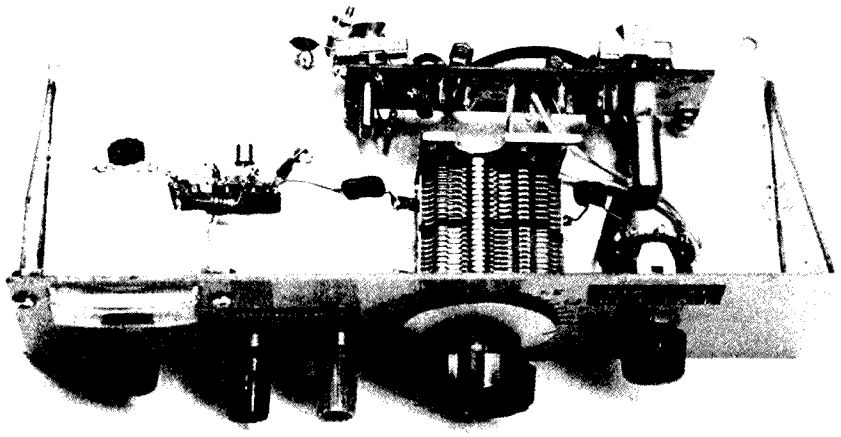


Fig 4—The "ugly construction" prototype tester built by W1FB. PC-board material is used for the chassis and panel (see text). The twin oscillators are mounted vertically near the tuning capacitor to keep the critical leads short. The meter amplifier is seen below the meter on a terminal strip.

S-meter. Any 100- or 200-μA meter may be used. You can use a 50-μA instrument, but adjustment of R1 and R2 may be more critical than when using a 200-μA movement.

I used tape labels for identifying the front-panel controls. A fine-point marking pen is ideal for marking the μH calibration on the panel (C6).

RELATIVE Q

The higher the M1 meter reading, when C6 is tuned for a peak indication, the higher the coil Q. This is a crude test at best, but it provides valuable insight into the coil quality. You can calibrate the instrument for more accurate Q readings by mounting R1 on the panel, then marking its range for various Q factors. The *ARRL Electronics Data Book (which is out of print — Ed)* explains how to measure coil Q, and a test circuit is provided. You may use one high-Q coil for the high-range calibration, then place a variable resistor (100 kΩ control) across the coil to provide various Q_u values by adjusting the control for specific lower resistances.

It is possible to build a very elaborate instrument by using the circuit in Figure t as a foundation. For example, a vernier drive and readout dial for C6 would represent an improvement. A shielded metal cabinet would represent a step forward, too. A larger meter at M1 would aid you in observing the meter action more easily.

CALIBRATION AND USE

Various capacitors may be used at C6, but whatever type you select should have a minimum capacitance of 40 pF or less, and the maximum capacitance needs to be 400 pF or greater. I used a surplus two-gang capacitor with both sections in parallel. The tuning range is from 35 pF to 465 pF, hence the overrun at each end of the panel dial scale.

I used a digital capacitance meter to calibrate the dial for C6. Marks were selected at 10, 20 and 30-pF increments, with the 10 pF marks near the minimum-capacitance range of C6, and the 30-pF increments towards the maximum- capacitance end of C6. The 20-pF markers are in the middle of the C6 range. Once these points are established, you may take that data, plus the known oscillator frequency, and determine the inductance value for reach capacitive increment.

C1 and C4 are adjusted for reliable oscillator starting when the HI-L, LO-L switch is cycled. I used a scope at the transformer secondary windings to set C3 and C4 for equal RF output from the oscillators. An RF probe and VTVM may be used for the same adjustment. With +12 V applied to the tester, but with J1 and J2 open, set R2 for a zero reading on M1. R1 may be set for a mid-scale reading when a test coil is attached to J1 and J2, and with C6 tuned for a peak reading on M1.

The harmonic traps are adjusted for a null on M1 when the spurious meter indication (mentioned earlier) is present. The tuning of these traps is sharp, so adjust them slowly!

You will find it handy to solder an alligator clip to a banana plug (two needed) for use at J1 and J2. This makes it easier to clip in a test coil, as opposed to unscrewing and tightening the posts on the jacks.

WRAP-UP

The crystal frequencies are critical if you wish to have the dial scale track on the various inductance ranges. However, if you do not object to plotting a scale for each range, you may use crystals of various frequencies for your instrument. My early tests, for example, were made with 2.1- and 8.0- MHz crystals, since these were the only ones I had that were close to the desired frequency. But remember, traps will need to be changed.

I am convinced that you will find this test instrument one of the most valuable in the shack. It will be helpful for determining the values of surplus slug-tuned coils and many toroidal and pot-core inductors.

Written by *Doug DeMaw W1FB*, ARRL Contributing Editor, PO Box 250, Luther, MI 49656, and reprinted from *QST* April 1986 ■

SHRINKAGE ADVERSELY AFFECTS SOUND TRACKS

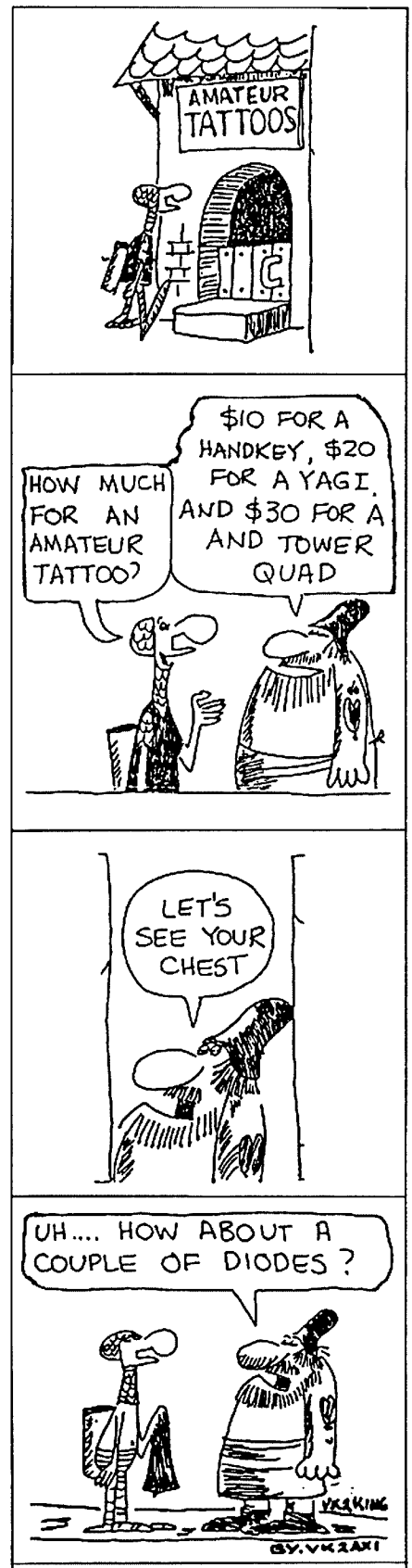
Dr Henning Schou, has devised and carried out experiments which demonstrate how film shrinkage adversely affects sound track quality, resulting in the loss of high frequency sounds.

The experiment which was carried out by Dr Schou, in Sydney, confirmed a principle which had been suspected for some time.

Dr Schou showed by means of a steady high-pitch tone of 8 kHz on film shrunk to various degrees, that the slippage which occurs in printing shrunk sound tracks onto new stocks leads to loss of these high-pitched sounds and can result in gross distortion.

He demonstrated the effect by playing a section of *Wagner's Ride of the Valkyrie* both as it should be and then as distorted by shrinkage.

From *National Film and Sound Archive Newsletter*, May 1986



Cartoon courtesy *The Propagator* July 1986

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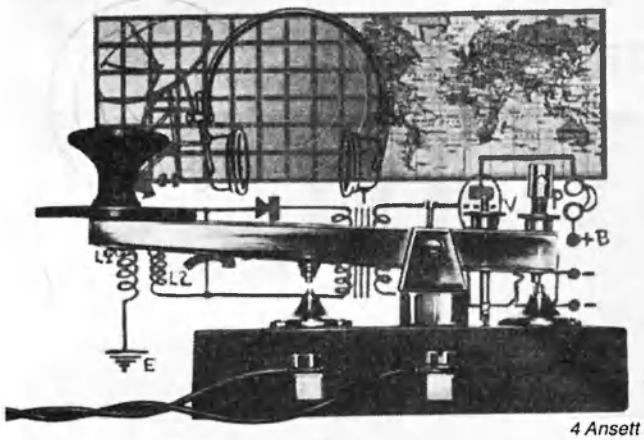

75th Anniversary of Amateur Radio: The Wireless Institute of Australia

Jim Linton VK3PC

4 Ansett Crescent, Forest Hill, Vic. 3131

AMATEUR RADIO THEMATIC PHILATELIC

About 10 years ago, Marilyn Syme VK3DMS, began to have an interest in philately, or stamp collecting.

But it was not until five years later that she became hooked on building up a collection of philatelic items related in some way to amateur radio.

Ironically it was AR's cover in May 1980, which showed various stamps associated with amateur radio (the hobby) that sparked off her now keen interest. "That cover of AR really got me started," says Marilyn who had since tried to get most of the stamps shown on the 1980 cover. With obvious disappointment in her voice, she says "it's almost impossible to get the stamps from South America."

Maybe a reader of this article has a way of obtaining the amateur radio theme stamps from South America to add to her collection?

Collecting stamps by a theme is a specialisation in philately. Obvious themes include boats and ships, music, Christmas, space, medicine, birds, fish, horses, flight — the possibilities are endless.

Stamps can be collected and arranged so they trace the historical development of something. But according to the Usborne Guide to Stamps and Stamp Collecting, it is not always necessary to put stamps in strict historical order even when telling a story through stamps. The overall look of the page in a thematic collection, grouping stamps together to emphasise parts of your story is acceptable.

Marilyn has about four dozen stamps in the amateur radio collection, and the hunt continues for new additions. She has developed a habit of looking very closely at stamps and stamp catalogues so as to not overlook a small detail which would justify a stamp being included in the collection. However, it is not just stamps which help build up her thematic collection. Post marks, first day covers (like the WIA 75th Anniversary pre-stamped envelope in 1985), and QSL cards which have gone through the mail as post cards.

Marilyn says one of her prized possessions is a QSL card for the "First German Post War Hamfest" — the first conference of radio amateurs in Germany immediately after World War Two. It took place on June 7-8, 1947, in Stuttgart — before the Berlin Wall divided Germany.

She says another philatelic rarity is a Pitcairn Island envelope issued to commemorate the first radio transmission from that tiny Pacific Island in 1938 — the signal was transmitted by a radio amateur. Marilyn says the stamps and other philatelic item contain a lot of very interesting history and background on amateur radio activities and developments.

Part of the pleasure of having a thematic collection is writing captions for each stamp to help tell the story within the overall theme.

STAMPS AN ALLIED PURSUIT FOR RADIO AMATEURS

The average active radio amateur or shortwave listener who chases DX often finds the postage stamps on overseas envelopes that arrive carrying a much-wanted QSL are almost of as much interest as the QSL.

Unfortunately, used or cancelled stamps as philatelists call them, can be of little or no use due to them being damaged, incomplete or spoiled.

But a little care when putting stamps on envelopes will increase the chances of them reaching their destination in good condition.

Putting a stamp in the extreme right-hand corner of an envelope is inviting it to be damaged in the postal system. Leave a few millimetres of blank envelope at the top and right-hand side of the stamp. However, experienced DXers advise against this practice when sending QSLs to some third world countries. Mail has gone missing and the theory is that in countries with a very low standard of living used foreign stamps can be converted into a meal.

The advise when sending direct QSLs to these countries is to use the plainest brown paper envelope, a damaged stamp or have it franked (cash register imprinted). While franking is officially only available when posting a large quantity of envelopes — it shouldn't be difficult to find a friendly postmaster who will assist in having the odd one or two letters franked.

And avoid identifying on the outside of the envelope that its contents are related to amateur radio — this will indicate that it contains International Reply Coupons or green-backs.

If stamp collecting does not interest you in the slightest, you will certainly find a relative, friend or neighbour who has a collection and be eager to take those foreign stamps which arrive with incoming QSLs.

Some of us playing our patriotic part also have a variety of used Australian stamps on hand to accompany direct QSLs sent overseas.

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LIST OF AMATEUR RADIO PHILATELIC ITEMS (not exhaustive)

YEAR	COUNTRY	FACE VALUE	REMARKS
1964	USA	*5 Cents*	ARRL 50th Anniversary
1966	Jordan	*1 Fil*	King Hussein
1966	Yugoslavia	*0 85d*	SRJ 20th Anniversary
1972	German Democratic Republic	*25P*	Society for Sports and Technology
1973	Colombia	*60 Centovos*	LCRA 40th Anniversary
1973	USSR	*4k*	Ernest Krenkel RA6M
1975	Poland	*1.50z*	IARU Region One Conference
1975	Costa Rica	*1.00 Colones*	16th Convention, Federation de Radio Clubes de Central America
1975	Costa Rica	*1.10 Colones*	16th Convention, Federation de Radio Clubes de Central America
1975	Costa Rica	*2.00 Colones*	16th Convention, Federation de Radio Clubes de Central America
1975	Spain	*3 Peseta*	King Juan Carlos EA0JC
1976	Dominican Republic	*6 Centovos*	RCD 50th Anniversary
1976	Dominican Republic	*10 Centovos*	RCD 50th Anniversary
1977	Japan	*50 Yen*	50th Anniversary of Amateur Radio in Japan
1977	Brazil	*1.30 Cruz*	Day of the Radio Amateur
1979	Dominican Republic	*10 Centovos*	Beata Island DXpedition
1979	USSR	*4k*	RS-1 and RS-2 Satellites
1979	Bolivia	*3 Pesos*	RCB 38th Anniversary
1979	Federal Republic of Germany	*60P*	WARC 79
1979	Switzerland	*70 Centimes*	USKA 50th Anniversary
1980	Poland	*2z*	PZK 50th Anniversary (post card and post mark)
1960	Dominican Republic	*7 Centovos*	Catalina Island DXpedition
1980	Argentina	*700 Pesos*	RCA 59th Anniversary
1981	USSR	*4k*	30th All Union Amateur Radio Exhibition
1981	Djibouti	*250 Franc*	Radio Club of Djibouti
1982	Ascension	*25 Pence*	Boy Scout Jamboree ZD8JAM
1982	Ascension	*90 Pence*	Boy Scout Jamboree ZD8JAM
1982	New Zealand	—	50th Amateur Radio Emergency Corps Anniversary (post mark)
1982	Poland	*27z*	D Maksymilian Kolbe SP3RN
1982	Chile	*7 Pesos*	ROC 60th Anniversary
1983	Sri Lanka	*2.50 Rupee*	55th Anniversary of Amateur Radio in Sri Lanka
1983	Jordan		Royal Jordanian Amateur Radio Society
1985	Australia	*33 Cent*	WIA 75th Anniversary (pre-stamped envelope)

(List source — Telecommunications Journal, December 1979, V Clark W4KFC (SK), JA3AER, N2ATT and VK3DMS)

REPEATERS — FRIEND OR FOE
A Further Look

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Last year, this author wrote a series on the early days of Australian Repeaters. He has received quite an amount of feedback on the earlier series, and now continues the repeater story in this issue.

It is 18 years since permission was first given to establish repeaters. The short period, 1972-75, will be remembered in Australian history, in both political, as well as the repeater sense. After 1975, came a period of general expansion, but that is another story for a later time!

I suppose repeaters, as we know them today, started their experimental life in VK2 about 1967, at Orange, where there were two car-phones set up back- to-back — input on (B) 146.000 and output (A) 145.854 MHz. Due to a local intermod on the input, it was changed to 146.100 MHz (C).

Permission to establish unattended repeaters was granted in late June 1968 and the first planning meeting for channels was held at Wodonga in September 1968. From that meeting came a four-channel 500 kHz split, input high, output low system centres around 146.000 MHz. The top (4) and lowest (1) channels were only to be used at that stage with four in the capital cities. (1 — 146.1 → 145.6; 4 — 146.4 → 145.9).

VK2 applied for licenses on 1 for Orange, Gosford and Wollongong, and 4 at Sydney and Newcastle. These were not granted until 1970.

It was soon found that the close geographical spacing and only two available channels had lead to interference and inability to introduce more services. A new meeting was held at Albury in July 1972.

It was proposed to:

- Change the offset to (minus) 600 kHz, shift the outputs to above inputs, with seven channels spaced 50 kHz.
- Introduce simplex channels round 146.500 MHz and phase out the old A-B-C at 146 MHz.
- New number systems were proposed by dividing the 144-148 MHz band into 50 kHz channels from 144.000 MHz upwards.
- The old repeaters on 1 and 4 became known as either 2 and 8 or 42 and 48, and in those days of crystal control, the order did not really matter.

The channels were as follows:

Repeaters

Ch or Ch	Input	Output	Now
42 or 2	146.100	146.700	6700
43 or 3	146.150	146.750	6750
44 or 4	146.200	146.800	6800
45 or 5	146.250	146.850	6850
46 or 6	146.300	146.900	6900
47 or 7	146.350	146.950	6950
46 or 8	146.400	147.000	7000

Simplex

49	146.450	6450
50	146.500	6500
51	146.550	6550
52	146.600	6600
53	146.650	6650

VK2 was not in favour of the change and at a special Sydney meeting on April 1, 1973, voted 216 to 10 to retain the old system. Even a special Federal meeting in September 1973 could not change VK2's outlook. However, as 1974 wore on, the thinking began to change, and in November another (VK2) meeting reversed the 1973 vote by a similar margin — 200 to 10 in favour of adopting the new plan. This freed the existing repeaters — Orange remained on 6700 and Dural on 7000. Gosford went to 6750, Wollongong to 6850, Newcastle to 6900, and Heathcote was granted 6800. 6950 was reserved for the Blue Mountains. The background for the rejection of the 1972 meeting by VK2 is fading as memories grow old. The reason was based on the intention internationally to introduce the satellite sub-band 145.800- 146.000 MHz. The Federal Repeater Secretariat from 1968 had been handled by VK2. By 1972, the VK3's had been trying to become the FRS and VK2 resisted. When VK3 proposed the new plan VK2 must have thought it was yet another southern plot and dug their toes in. Federal placed the FRS in VK5 for a time. It then reverted to VK3 and the passing of time saw it change from a specialist committee into one of the functions of FTAC. 1985-86 saw the production of the *Repeater Policy Paper.*

Meanwhile back in VK2 applications were submitted to change systems to the new channels. Dural was waiting for permission when a commercial base- station on 72.950 MHz was re-located from near Parramatta to Dural. This being half the Dural output frequency, the base began to hear the repeater multiplier chain. To overcome the problem and allow people time to obtain crystals, the new output frequency (147.000) was installed at Dural, and the old (145.900) was installed at Paddington and linked from Dural.

About 1975, even seven channels proved insufficient, so simplex Channel 53 — (146.650) was paired with 146.025 MHz to become Channel 1, and expansion into above 147 and 25 kHz channel spacing began. By now, rigs had changed from valve to solid-state, but were still mainly crystal locked. (America was the assumed world leader in repeaters and their plan centred on 147 — the user receivers centred on 147 and the transmitters shifting high or low at 600 kHz offset). Our plan gave Australia 31 channels on two metres. Now (1986) the larger States have almost exhausted the allocations.

Throughout the repeater development the various changes had been submitted to and debated at the Federal COnventions. The outcomes have formed the basis of Australia's Band Plans, which, together with established repeaters, are listed in the annual Call Books. These plans are often wrongly referred to as WIA Plans. They are co-ordinated by the WIA, but input effectively comes from all interested users by the various forms of representation.

The development of VK2 repeaters has continued during the past 10 years, and by mid-year, 1986, there were 40 on two metres and 16 on 70 cm. They have not been without past and present hassles, hence this series title — *Repeaters — Friend or Foe!* The development of individual systems will be outlined in future articles.

The development of repeaters on other bands followed the two metre systems. Next was the 70 cm band. Unlike two metres, where the amateur is the primary user, 70 cm is a 30 MHz segment where the amateur is a secondary service to Radio Location. In 1975, permission was granted to place unattended operation systems — beacons and repeaters — in the segment 430-440 MHz. There were some allocations already in place like the tunable operation at 432 (the third harmonic of 144) and the international ITU noted Amateur Satellite Service between 435 and 438. This really left very little choice. Region 1 had two standards, a 1.6 MHz offset of 16 channels in 433-435 MHz, or the 7.6 offset between 431-438 MHz. North America had their repeaters between 440-450 MHz with 5 MHz offset, inputs high or low, depending on the region. Canada lost this band at WARC 1979, and American amateurs up to 80 km south of the border have also recently been restricted from this segment of the band.

The Australian choice became what we have — outputs 438-440 MHz and input 433-435 MHz, minus 5 MHz offset and 25 kHz channel spacing. The reason most systems are either on 25 or 75 is that, in 1975, it was thought that these would be harmonic problems from two metre systems. It is policy still that only 25 or 75 be used. In VK2, on the coastline (at least) we have observed this approach so that the even 00 or 50 channels are clear for Tasman openings. New Zealand has six channels starting at 438.500 MHz and each 50 to 438.750 MHz.

The harmonic problem was that 438 is three times 146. However, it is a user problem, for if you transmit on Channel 6700, your harmonic will appear on 438.300 MHz. This thinking occurred while there were 50 kHz channels on two metres, but no longer is valid with 25 kHz spacing. It is a planning consideration now to avoid harmonic relationships. For example — if your area has an 8525 on 70 cm, you would not have a 6775 on two metres or the user will have feedback if listening on 8525 while transmitting on 6775. (146.175 x 3 = 438.525).

70 cm Simplex is the segment 439.000 ± .25 MHz and the low and high repeater channels 438.025-438.725 and 439.275-439.975.

Six Metres — This band has had a rough life. It was the replacement band for the old five metre (56 = 60 MHz) allocation. Granted in the 1950s, it was 50-54 MHz, and available during the best ever sunspot cycle peaking round 1958. In 1964, Australia lost 50-52 MHz for Channel 0 television (New Zealand lost 50-51 MHz for their Channel 1). Since then, use of this band has declined, no doubt in the main by the presence of Channel 0-1 television throughout most of the country. The closing down on January 6, 1986, of the SBS VHF Channel 0 Sydney and Melbourne has still left VK4, 2 and 7 with more than a dozen Channel 0 signal sources from commercial and national television.

On the FM side of six, most activity has centres on 52.525 MHz, which is in international use. Even Radio Peking once used it for a program link. In Australia there have been hundreds, maybe even thousands, of low band 'car- phones' pointed toward six metres, but only a few have made it to 52.525 MHz. In VK6 they had a channel on 52.656

MHz, and VK2 made a little use of 52.700 and 53.950 MHz. There was perhaps more AM activity with converted Pye Reporters on channels like 53.032, 53.035, 53.100, 53.866 and 53.982 MHz. Most systems developed due to the availability of surplus crystals.

Demand for six metre repeaters in Australia has been limited. There is one licensed in VK6, two in VK3, one in VK2 with current interest for a second in VK2 and one in VK4. The Australian Band Plan was developed when the international offset was 600 kHz. Since then, America has adopted a 1 MHz offset and equipment manufacturers have altered to suit. At the 1986 Federal Convention it was agreed to change our offset to 1 MHz. These changes are currently being incorporated in the Band Plan.

The plan set the channel spacing at 25 kHz with two channels for each of Australia's eight States or Territories on a single use per channel basis. The thinking was to allow clear channel working during times of band openings. There is nothing to prevent a State Repeater Committee re-using the same channel as often as they like within their State, particularly if they pick the null points in the usual local skip distances. Interstate openings may key more than one, but is a small price to pay if it helps to get activity on the band!

Overseas (mainly America) 10 metre repeaters have developed, often with extra inputs/outputs on VHF/UHF channels. The segment is 29.500 to 29.700 MHz, four channels, 20 kHz spacing with 100 kHz offset. Simplex at 29.600 MHz. To date, there has been limited VK3 and VK6 interest. If established they would only be available to full call licensees. From an engineering viewpoint they ideally need split receiving — transmitting sites to overcome the de-sense present with the close input/output spacing. VK6 have progressed to the point where they have prepared and submitted an application for a 10 metre repeater.

Moving toward the other end of the spectrum, the 23 cm band is now starting to attract international repeaters. The equipment being manufactured usually covers 1260-1300 MHz. 25 kHz channel spacing with fully programmable offsets. The world has a variety of offsets, the Japanese have 20 MHz, and some Europeans have 33 MHz. Australian amateurs are the secondary service in this band to Radio Location and has to observe the (ITU) Amateur Satellite Service 1260-1270 MHz. Also, Australia has 6-150 mile (10-240 km) radius aviation radars in the segment 1270-1280, together with the tunable portion at 1296 (144 x 9) and further radars starting at 1300 MHz. Much debate has occurred for the Australian repeater segment and there appears little option other than the chosen segment in 1240-1260 MHz with a 12 MHz offset.

It is unlikely that there will be any repeaters in the higher microwave frequencies in the near future although there are a few specialised systems in America.

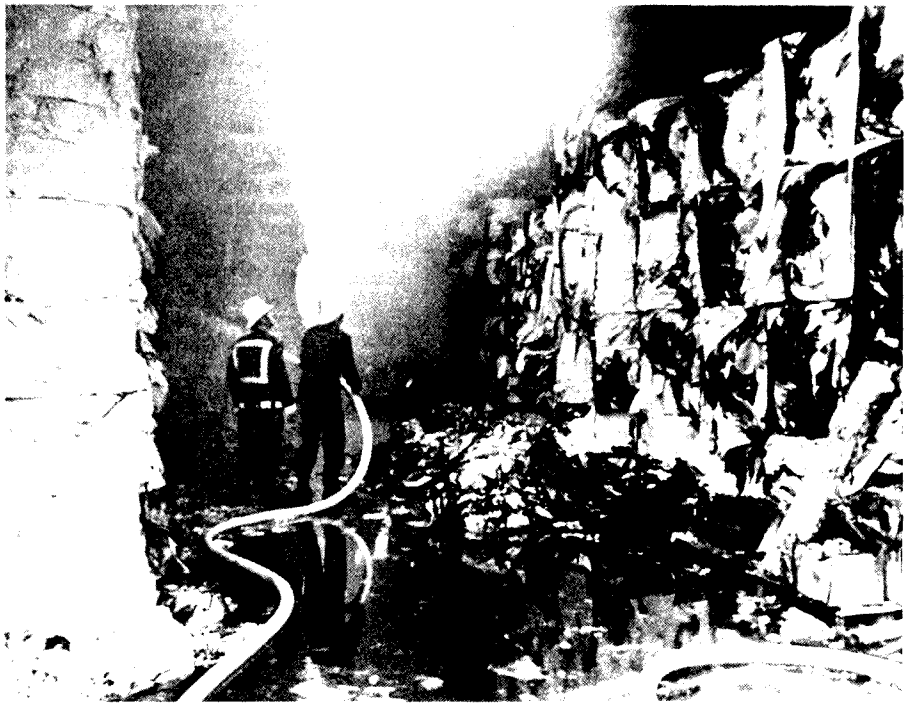
Another repeater interest for Australia is those developed for amateur television. Reception of signals has been made easy by having a segment available to the amateur service within the tuning range of a television set with a UHF tuner. Developing a good signal for a television transmission is difficult when one considers the bandwidth involved and the amateur power levels available. Add to this the difficulty of developing power for the higher the frequency in use.

There are two amateur television channels at 70 cm — ATV1 (video 426.250) and ATV2 (444.250), one at 50 cm, Channel 34/35 and two at 23 cm. The popular combination for a repeater is to transmit to it on ATV1 and view the output on 50 cm.

The final form of repeaters must be those carried aloft in the various amateur satellites which provide both in-band and cross-band operation.

Since 1975, repeater development has been straight-forward following the guidelines and established band plans. It has not been without drama — various repeaters have been attacked and/or stolen, others fall victim to anti-social behaviour. Many have reflected amateur ingenuity in sites, power sources or what functions they perform. Their story will be told in future issues of *Amateur Radio*. ar

FIRE DEVASTATION



A few hours after August *Amateur Radio* left the premises at midday, July 16, a severe fire commenced at Leader Westernport Printing Pty Ltd, the printers of *Amateur Radio*. They recently acquired the business from the Waverley Offset Printing Group.

The fire became uncontrollable within minutes and even with the services of 14 fire and two snorkel units, manned by 60 firemen, the plant that employs in excess of 50 staff, was unfortunately gutted beyond repair with damage which is presently estimated to be in excess of three million dollars. Fortunately, none of the personnel were injured.

Processing equipment from sophisticated cameras to printing presses were reduced to rubble within the hour, including many tonnes of paper, hundreds of litres of chemicals, inks and considerable artwork belonging to numerous customers (some irreplaceable) being destroyed.

The famous saying of the theatre industry "The show must go on . . ." can also be attributed to the printing fraternity, as, within hours of the catastrophe, alternative arrangements were made for the printing of this and future issues of *Amateur Radio*, so that they would be in the mail boxes within a day or two of the scheduled date, to alleviate as much inconvenience as possible to members in the ensuing future.

Thank you, management and staff of Leader Westernport for your consideration.

Submitted by Ken McLachlan VK3AH

Firemen were helpless as the rear wall of the plant collapsed. They then directed their attention to extinguishing the rolls of paper in the factory.

Photograph courtesy *Herald and Weekly Times Pld Ltd*

ILLAWARRA AMATEUR RADIO SOCIETY

The Illawarra Amateur Radio Society will celebrate 25 years of operation in the Illawarra area during March 1987.

At a committee meeting held on June 17, 1986 it was decided to try to arrange a special occasion for this important anniversary.

To make it a gala occasion, the society would like to hear from members, past members, past members families or anyone who has knowledge of (no matter how small) the amateur radio clubs existence in the Wollongong area during the period 1962-70.

Any information, memories, documents and even photographs which would be used to compile an up-to-date documentary for the occasion would be sincerely appreciated.

All items submitted will be handled with utmost care and will be returned to their owners in their original condition.

Acknowledgment will be given to the persons concerned if they so desire.

Any readers who may be able to help with this matter are requested to contact Dave VK2PZY on 84 9872 or Morry VK2EMV. 83 1219, or write to them care of the club at PO Box 1838, Wollongong, NSW. 2500. ar

REPORT OF THE FTAC REPEATER AND PACKET PAPERS

Peter Gamble VK3YRP
Chairman, FTAC

As indicated in earlier issues of *Amateur Radio*, the *Federal Technical Advisory Committee* (FTAC) had prepared discussion papers titled "Review of Amateur Radio Service Terrestrial Repeaters" and "Review of Amateur Radio Service Packet Communications." Summaries of these papers were printed in the February and March 1986 issues of *Amateur Radio*.

A paper titled "Band Plans for the Amateur Service" was also prepared and was presented in a three part article in the January, February and April 1986 issues of *Amateur Radio*.

Following comments from a number of amateurs, amendments were made to the papers, which were then printed and circulated for discussion at the 1986 Federal Convention. A brief presentation was made on the highlights of each of the papers by the Chairman of FTAC. Following extensive discussions, both in the formal Convention sessions and during "meal" and other breaks, the papers were adopted with some modifications.

The following article presents the recommendations from the "Repeaters" and "Packet" papers. The results of the discussion on the "Band Plans" paper will appear next month.

One of the topics in the Repeater paper which caused the most interest was the subject of the cross linking of repeaters. Accordingly, that section of the paper is presented in full.

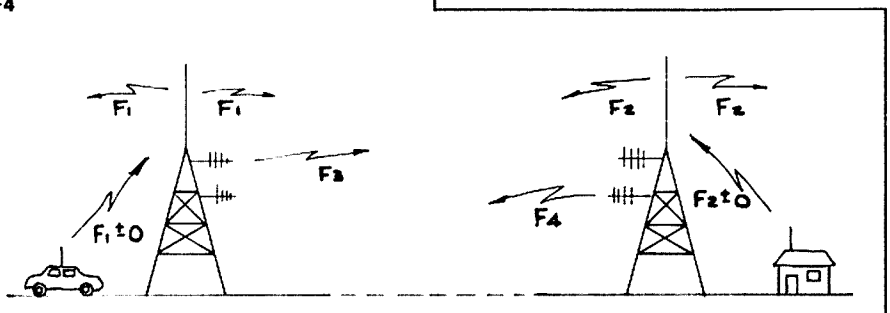
4. CROSS LINKING OF AMATEUR REPEATERS

4.1 Introduction

As indicated in the opening section of this paper, repeaters are an enhancement of the amateur service. There are many ways that this enhancement can be achieved, such as by using new technologies and new modes, and by expanding considerably the service area of an existing repeater. A typical example of the last point is the expansion of the amateur satellite service where VHF/UHF contacts to countries halfway round the world are now possible.

Figure 1 illustrates the general components of repeater linking. Note that a key part of the linking process is the establishment of separate transmit and receive equipment to pass the linked signals from one repeater to another. Where repeaters share an overlapping service area and the same transmitting and receiving frequencies, but do not exchange the repeated signals on a separate frequency, they are not considered to be linked. An example of this type of operation are some of the packet repeaters now being established.

Figure 1 — General Configuration of Linked Repeaters.
Repeater 1: Transmit Frequency F1, Receive Frequency F1 ± 0
Repeater 2: Transmit Frequency F2, Receive Frequency F2 ± 0
Link Frequencies: R1 to R2 ➡ F3, R2 to R1 ➡ F4



4.2 The Present Situation

One technique for expanding the service area of a repeater is to link it to another repeater. This could be done for a variety of reasons, for example to carry a news broadcast to more listeners, or to provide coverage from an isolated country area back to a neighbouring town or city, or to link a major population centre with its nearby recreational area.

Approval has been given by the Department of Communications for three particular instances of cross linking on a trial basis. These are:

- Tasmania — a link to relay WIA Broadcasts,
- South Australia — to link city and country Amateur Television activities,

and

- Western Australia — to link city and country voice repeaters where the country repeater serves an isolated stretch of highway north of Perth.

It is anticipated that further requests for repeater linking will be forwarded to the Department. These are expected to be primarily for extending the service area of a repeater, whether it be voice or specialist modes such as Amateur Television or Packet Radio.

4.3 General Guidelines for Repeater Cross Linking

The Wireless Institute believes that cross linking of repeaters should be supported provided that certain conditions are met. The reason for the cross linking should be consistent with the aim of enhancing the amateur service.

The following points are offered as guidelines for the licensing of linked repeaters irrespective of mode:

a. Each repeater in the linked group is to be licensed individually according to the normal repeater licensing requirements. The cross linking is to be the subject of a separate application. Further, approval in principle may be sought for any or all of the applications.
b. Cross linking of repeaters will not be permitted where such an arrangement allows an amateur to originate a signal on a band or in a mode that he or she is not normally permitted to use.
c. Cross linking may be either permanent; ie all transmissions are cross linked, or temporary for specific purposes; eg only WIA news broadcasts or WICEN activities are cross linked. Where cross linking is for a temporary specific purpose, then it may be appropriate to modify some of the following conditions as indicated.
d. The traffic and interconnecting signals for permanent cross linking of repeaters should not normally be carried in the same amateur band. While it is preferred that this band be a higher frequency band, it is noted that propagation characteristics of a particular location may require the linking to be done on a lower VHF/UHF band. Further, the cross linking frequencies should be in accordance with an approved Wireless Institute Band Plan.

Cross linking of repeaters for a temporary specific purpose; eg a Wireless Institute Broadcast or for WICEN activities, will be permitted to use "off-air" signals for Input.
e. Where the cross linked repeaters are in different states, then approval of all the relevant WIA Divisions is required.
f. The maximum number of repeaters to be cross linked where simultaneous emission is used will usually be a maximum of three. Where the received transmission is stored before re-transmission; eg in RTTY or Packet mode operations, or where repeaters may be selectively added to the link, then this limit does not apply. This restriction does not apply to the cross linking of repeaters for a temporary specific purpose; eg a Wireless Institute Broadcast or for WICEN activities.
g. All ATV repeaters and links should not use double-sideband emissions only for picture signals.

It is noted that further mode specific conditions may need to be applied from time to time to overcome difficulties that are being encountered or are foreseen.

RECOMMENDATIONS

The Wireless Institute believes that the present approach by the Department of Communications to amateur service repeaters and translators is generally satisfactory. This is shown by the ever increasing number of these devices that are being placed into service by the amateur fraternity.

However, there are a number of points arising out of the new regulations which require further discussion and consideration. Accordingly, the Wireless Institute makes the following recommendations:

1. That the justification or need for a repeater is a matter for the amateur service to determine.
2. That the Wireless Institute develop and publish guidelines for the use of various modes of repeaters as required.
3. That the Wireless Institute develop a procedure to co-ordinate repeater licence applications.
4. That the Wireless Institute develop a set of maximum time-out periods for various modes and locations of repeaters, policies for the use of specialised access control techniques, and other technical standards as necessary.
5. That the Wireless Institute discuss further with the Department of Communications the ef-

fects of ensuring amateur repeaters met specified constructional and operational standards with a view to minimising the effect on amateur repeaters when interference is being caused by other spectrum users.
6. That repeaters continue to be permitted in the six metre band and that the matter of repeaters in the 10 metre band be discussed with the Department of Communications with a view to such devices being permitted in accordance with international band planning principles. Further, that 10 metre repeaters be permitted to use 5 kHz deviation transmissions.
7. That the guidelines proposed in Section 4 of this paper for the cross linking of repeaters in the amateur service be approved.

If the above recommendations are accepted by the Department of Communications, then the enhancements they permit to the amateur service repeaters will allow amateurs to continue to experiment with new technology, and to provide valuable community service in times of need.

In addition to the presentation of the Packet Radio Paper, which include some explanations on Packet techniques, the Melbourne Radio Packet Group put on a demonstration. This enabled the delegates and visitors to see first hand the operation of a Packet Radio Station.

The following is the final section of the paper which contains the recommendations:

7. RECOMMENDATIONS

After consideration of the various issues raised by the development of Packet Radio Communications, the Federal Technical Advisory Committee presents the following recommendations for adoption by the Wireless Institute of Australia.

1. All Packet Radio Protocols which ensure that call signs or call sign information is contained in each packet should be permitted, and that no requirements be placed on equipment design except those generally necessary under the existing amateur radio service regulations.
2. Any amateur radio operator may set up a packet radio station if permitted to do so under the terms of their existing licence. Further, such an amateur station may operate in the unattended mode for the purpose of receiving information from another packet mode station providing that suitable fail- safe firm-ware is incorporated to ensure that the transmitter cannot remain keyed on for an excessive period of time. While this station is operated in the attended mode, it may be used to receive and retransmit incoming packets destined for other amateurs, and also provide computer or network resources.
3. Any group of amateurs may apply for a licence to establish and operate a continuously operating range extending or repeater device for packet radio. Such an application should be in the form of a conventional repeater application. No restriction should be placed on access to this facility by appropriately licenced amateur operators.
4. Any amateur or group of amateurs may apply for a licence to establish and operate a continuously operating station which provides computer resources for other amateurs. Such an application should be in the form of a conventional repeater licence. It should not be mandatory for restrictions to be placed on access to this facility by appropriately licenced amateur operators, this being up to the discretion of the licenced operator. All calls to this facility are to be logged by the system, the information to be recorded to include call sign information and time and date. Further, if such a system is connected to a telecommunications network, then material originated from such a network cannot be made available for transmission over the amateur radio link. Further, a system licenced under this section is permitted to automatically originate a call over the amateur radio service and deliver a previously lodged message.
5. That the above recommendations 1. to 4. be represented to the Department of Communications as guidelines for the operation of amateur service packet radio stations.
6. That protocols which comply with these guidelines and make efficient use of the radio spectrum be promoted.
7. That Terminal Node Controller designs which allow the use of more than one protocol be promoted.
8. That range extending repeater devices and computer systems that comply with recommendations c. and d. above be promoted.

If the above recommendations are accepted, both by the WIA and the DOC, then amateur radio operators will be able to continue exploring new frontiers of technology in the traditions established over the last 75 years.

Following the adoption of the above recommendations on Repeaters and Packet Radio at the 1986 Federal Convention, the Federal Executive was requested to make the necessary representations to the Department of Communications. That process has already started and further reports will be presented on the results of the discussions with DOC.

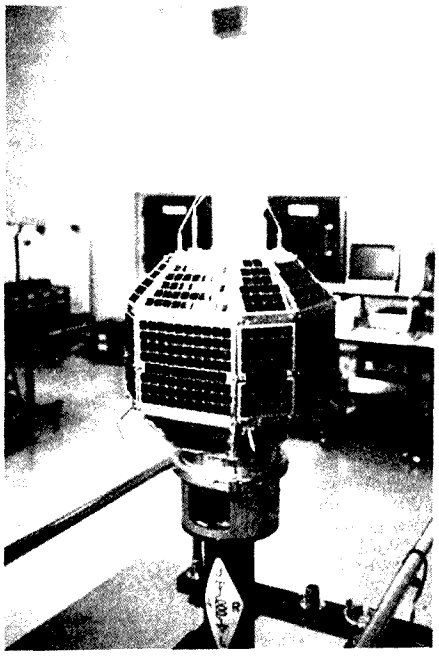
I would like to thank all of the amateurs who contributed to these papers, both during their initial drafting and as a response to the printing of the earlier versions in *Amateur Radio*. As a result of the wide ranging discussions that had been held right around Australia on these topics, the Federal Councillors were well briefed on the issues when they arrived in Melbourne for the Convention.

References:

1. *Review of Amateur Radio Service Terrestrial Repeaters*, Issue 4.0, dated July 10, 1986.
2. *Review of Amateur Radio Service Packet Communications*, Issue 3.0, dated July 10, 1986.

JAS-1 IS GO

The Japanese Amateur Satellite Project, JAS-1, has been promoted since 1983. JAS-1 was due to be launched on August 1, 1986. Following is a general run-down of the leadup to the launch.



Project JAS-1 began in 1983. Flight Model FM-1 was completed in March 1985 and FM-2 in November 1985.

FM-2 began its journey to Tanegashima on June 21, 1986, using a vehicle with air-suspended wheels. It was accompanied by much measuring and test equipment. It arrived on June 24, 1986. Flight Model 1 followed FM-2. The reason why both satellites were taken to the centre was to be prepared for any type of emergency.

Tanegashima, the launching site, is located in the southern part of Japan. Tanegashima (shima means island) is historically famous to Japanese people as the place the matchlock was brought to Japan for the first time by Portuguese more than 400 years ago.

The National Space Development Agency of Japan (NASDA) newly developed launch vehicle H-I consists of two stages of rocket, with the propellant of the second stage being liquid oxygen and hydrogen. This vehicle is capable to "throw" a payload of 1800 kilograms into an orbit of 1500 kilometres altitude with an inclination of 50 degroes.

This will be the first flight of H-I. Instead of a dummy payload, three missions will be on board H-I. They are: EGP, the experimental geodetic payload, JAS-1 and the magnetic bearing flywheel experiment.

About one hour after launch, the second stage rocket will be over the South American Continent and the two payloads will separate from the rocket sequentially.

JAS-1 will be activated at the moment of separation when the power supply turns on, and the first signals should be heard by the Centro de Estudios Espatiales (CEE) of the University of Chile.

About 20 minutes later, JAS-1, flying northward, will be over England where the staff of the University of Surrey will be waiting to check the health of the *new-born* satellite.

When JAS-1 is successfully separated from the launch vehicle, it will transmit a beacon signal on 435.795 MHz from a Japanese transponder, with some Doppler shift of frequency.

The beacon contains the telemetry data in a format shown in Table 1. This data is sent in Morse code, beginning "Hi Hi" with a speed of about 100 characters every minute. It repeats in this format.

Table 1.

Hi Hi	1A	1B	1C	1D
	2A	2B	2C	2D
	3A	3B	3C	3D
	4A	4B	4C	4D
	5A	5B	5C	5D

There are 30 items of data and 33 items of status in the telemetry of JAS- 1, however, the beacon carries 12 data items and all status.

The telemetry reads as follows:

In analog data 1A *through* 3D, A, B, C and D express two digits of decimal value. This is a row data and the value should be divided by 50. Let this quotient be N, for each item. True value of each item is obtained by the conversion shown in Table 2.

Table 2 –Conversion of Analog Telemetry

Item		
1A	Current of Solar Cells, 0-2 A	I = N Amp.
1B	Charge/Discharge Current of Battery, -2 to +2 A	I = -(1 -N) x 2 Amp.
1C	Terminal Voltage of Battery, 0-20 V	V = N x 11 Volt.
1D	Centre-tap Voltage of Battery, 0-10 V	V = N x 4.92 Volt.
2A	Bus Voltage, 0-20 V	V = N x 10.08 Volt.
2B	Regulated Voltage +5 V, 0-7.5 V	V = N x 3.004 Volt.
2C	Output Power of JTA, 0-3 W	$P = N^{1.618} \times 1.101$ Watt.
2D	Calibration Voltage, 0-2 V	V = N Volt.
3A	Temperature of Battery Cell, -50 to +70 degrees Celsius.	
3B	Temperature of Bus Structure 1	
3C	Temperature of Bus Structure 2	Temperature is reduced as
3D	Temperature of Bus Structure 3	T = (1.3 - N) x 73 degrees Celsius.

This table of telemetry does not show any nominal value, but these values will tend to converge to some definite values or range through the operation of the satellite for several months.

Table 3.

Decimal	Binary	Decimal	Binary
0	000	4	100
1	001	5	101
2	010	6	110
3	011	7	111

Status is expressed from 4A through 5D. Each character represents two digits of decimal numbers, 0 to 3 for the left digit and 4 to 7 for the right digit. These two digits can be written in binary code as shown in Table 3. You can find five independent binary pairs out of this Table. For example, if the first item of status 4A were 423, 4 should be removed, and the binary code (010) for 2 and (011) for 3 are put in order, 010011. The left bit of two binary sets, 0 is common or redundant, so the first 0 is removed — thus it becomes 10011. This expresses the inverted order of status, No 5 to No 1; ie 1:No5 beacon PSK, 0:(blank), 0:(blank), 1:JTD ON, 1:JTA ON. Expression of status goes like this to status No 33, every five status, and this is shown in Table 4. This expression is possible because all of the status have only two situations, ON/OFF or 1/2 and so on.

The launch window will be limited within two hours, 2000 to 2200 UTC of the pertinent day. JAS-1 will begin to transmit its beacon signal with the telemetry described in this article, after its separation from the launch vehicle above the South American Continent.

Initially, JAS-1 will be operated only in analog mode. For digital operation, preparation working is required and it will become available one to two months after launch.

Table 4 — System Status.

1	JTA On/Off	12	PCU Level-II	23	IPL Sel 0
2	JTD On/Ofl	13	PCU Manu/ Auto	24	IPL Sel 1
3	(Blank)	14	CMD Priority	25	CRC Mod
4	(Blank)	15	CMD Sel	26	Sunlit/Shade Sensing 1
5	Beacon PSK/ CW	16	MEM 0 On/ Off	27	Sunlit/Shade Sensing 2
6	UVC On/Off	17	MEM 1 On/ Off	28	Sunlit/Shade Sensing 3
7	UVC Level 1/2	18	MEM 2 On/ Off	29	Sunlit/Shade Sensing 4
8	BAT Full/Tric	19	MEM 3 On/ Off	30	Sunlit/Shade Sensing 5
9	BAT Logic F/T	20	CPU On/Off	31	CW CPU/TLM
10	Main Relay On/ Off	21	MSEL 0	32	CPU Reset
11	PCU Level-1	22	MSEL 1	33	CW TLM

SPECIFICATIONS

Scheduled launch, August 1, by H-I vehicle from the Tanegashima Space Centre of NASDA, Japan.

The orbit will be circular at an altitude of 1500 km. Period — 116 min, Inclination 50 degrees. Projected three years life.

JAS-1 is a Polyhedron of 26 faces covered in solar cells, weighs 50 kg and is 400 mm (diameter) x 470 mm (height). Power generation — eight watts at the beginning of life.

Communication Sub-system: Analog (JA) and digital (JD) communication in mode J.

Transponders:

Analog transponder (Linear transponder)

Input frequency — 145.900-146.000 MHz (bandwidth 100 kHz)

Output frequency — 435.900-435.800 MHz (inverted sideband)

Required uplink EIRP — 100 watts

EIRP of transponder — two watts PEP

Digital transponder

Input frequency — four channels of 145.850, 145.870, 145.890, 145.910 MHz

Output frequency — 435.910 MHz (one channel)

Required uplink EIRP — 100 watts

EIRP of transponder — one watt RMS

Signal format — 1200 Baud PSK, store and forward

Beacon and Telemetry

JA Beacon — 435.795 MHz, 100 mW CW or PSK

JD Telemetry — 435.910 MHz, one watt PSK

Orbit Parameters:

Epoch — 1986-07-31, 21h, 32m, 07.20s UTC

Semi-major axis — 7879.562 km

Eccentricity — 0.000140656

Inclination — 50.0039 degrees

RA of ascending mode — 237.456 degrees

Argument of perigee — 2.155 degrees

Mean anomaly — 330.246 degrees

Compiled from material supplied by Shozo Hara, President, JARL

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EXTRACTING TOOL FOR LCCs

The EX-4 is a hand-tool for safely and reliably extracting leadless chip carriers (LCCs) from board mounted sockets. It helps prevent unnecessary overstress to chip carrier pins by maintaining even pressure on contacts during removal.

When the operator is properly grounded, the easy to use tool safely dissipates static charge to prevent damage to components.

Models are available for 20; 28; 44; 52; 68; 84 and 124 contact chip carriers.

Abridged from *Electronic News*, p34 — April 1986

Australian Amateur Station Call Signs

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

This is a guide to call signs, and special prefixes and suffixes issued by the Department of Communications to stations in the Amateur Radio Service.

The unrestricted licence call sign prefix is VK followed by a single number indicating the state or territory in which the station is licensed.
0 — Australian Antarctic Territory; 1 — Australian Capital Territory; 2 — New South Wales; 3 — Victoria; 4 — Queensland; 5 — South Australia; 6 — Western Australia; 7 — Tasmania; 8 — Northern Territory; 9 — External Territories (VK9L — Lord Howe Island; VK9M — Mellish Reef; VK9N — Norfolk Island; VK9X — Christmas Island; VK9Y — Cocos (Keeling) Islands; VK9Z — Willis Island).

SUFFIX

The suffix indicates the licence grade.
Amateur Unrestricted — AA-ZZ; AAA-FZZ.
Amateur Limited — TAA-TSZ; TUA-TZZ; XAA-XZZ; YAA-YZZ; ZAA-ZZZ.
Amateur Novice — MAA-NZZ; PAA-PZZ; VAA-VZZ.
Amateur Combined (Novice and Limited — JAA-KZZ
(Exceptions were VK5JSA and VI5JSA for Jubilee South Australia which has amateur unrestricted privileges).
Amateur Repeaters and Beacons — RAA-RZZ

There are exceptions to the three-letter R-suffix. VK3RAN is issued to an amateur radio station set up on the HMAS *Castlemaine* a preserved World War Two Corvette located at Gem Pier, Williamstown, and VK1RAN is the Royal Naval Amateur Radio Society, whilst VK4RAN is operational on board the HMAS *Diamantina* under the auspices of the Queensland Maritime Museum.

Some departures from the normal call sign suffixes include GGA Girl Guides Association, and SAA-SZZ Scout Association.

Other miscellaneous club-type stations are VK3SES, Victorian State Emergency Service, VK3SJA, and VK3SJB St John Ambulance Brigade, and teletype groups in various states have the suffix TTY.

A station with a suffix from the block WIA-WIZ is associated with WIA activities. These call signs are used by either WIA club stations or WICEN. VK3WIA is the club station of the WIA Federal Body.

The suffixes WI, AWI and BWI are traditionally reserved for the WIA. In VK3 and VK4 the WIA also has the ZWI suffix.

The holder of call signs with the suffix AA is listed as "Official Call Sign" which means the Department of Communications.

DISTINCTIVE SUFFIXES

From time to time, special call sign suffixes are issued. VK2OTC is the Overseas Telecommunications Commission Amateur Radio Group, the suffix ITU is for use by the WIA which is a member of the International Telecommunications Union through the International Amateur Radio Union, the Commonwealth Games station in Brisbane AX4QCG had an activation period of September 30-October 9, 1982, VK3UAM was a demonstration station call sign for University of the Third Age, Monash. The World Communication Year (1983) saw the suffix WCY used, IYP was a suffix during the International Year of Peace (1986), and VK1WVH is the Woden Valley Hospital Radio Club.

ALTERNATIVE PREFIXES

The alternative optional prefix AX was first used in commemoration of the Cook Bicentenary (1970).

The next occasion was for the Royal Australian Corps of Signals Jubilee when commemorative station AX3SIG was on air from the Signals Depot, Watsonia Barracks, Macleod, Victoria, November 3-10, 1975.

Four years later, AX was used to mark the 150 Anniversary of Western Australia in 1979.

The AX prefix celebrated the Royal Wedding on July 29, 1981, the Commonwealth Games in Brisbane saw AX available from August 15-October 15, 1982, and AX helped celebrate the America's Cup win by Australia on September 27, 1983.

A special call sign, AX0PB, was issued for Project Blizzard (1983-84 and 1985-86) in recognition of the project's national significance when it undertook restoration work on Mawson's Hut and scientific investigations in the Antarctic.

Another alternative prefix VI was first used for the 150th Anniversary of European settlement in Victoria (1984-85), then for the WIA's 75th Anniversary (1985), followed by commemorative call sign VI5JSA marking Jubilee 150 — South Australia's Sesquicentenary (1986).

The next likely occasion a special prefix will be available is for Australia's Bicentenary in 1988.

A unique call sign, VK75A, was issued by DOC in 1985 for use by the WIA during its 75th Anniversary in recognition of this milestone in amateur radio. It was the first and only amateur radio call sign in Australia with a double-digit prefix and also had the distinction of having a single letter suffix.

During the WIA 75 celebrations VK75A was activated by WIA members throughout Australia on a roster basis.

Overseas visitors in Melbourne for the WIA 75 Dinner, November 1985, were issued calls from the virgin block of VK3FAA-FZZ.

WHY HAVE SPECIAL PREFIXES OR SUFFIXES?

Various events and anniversaries throughout the world are celebrated each year — sometimes they have only local interest, but can also be of national or international significance.

Postal authorities bring out stamps, pre-stamped envelopes, first-day covers, and post-marks to help celebrate a special occasion.

Commemorative car number-plates, T-shirts, coins, medallions, badges, and regalia also provide a means of having something personal and tangible to celebrate an occasion

The hobby of amateur radio helps spread international friendship and understanding, and it is a national thing for radio amateurs to commemorate a significant event through their hobby. After all, our hobby is part of the general community and by using special prefixes or suffixes at the appropriate time it can play its part in a celebration.

An Australian event can be publicised overseas on air and via follow-up commemorative QSL cards or awards. This has also given participating radio amateurs the opportunity of radio, television and newspaper publicity about amateur radio's community role in helping celebrate an event.

NOT ALL VK STATIONS ARE AMATEUR

The letters VK are used in call signs for other than amateur radio stations. Experimental Stations can be given VK calls, with the same numerical indicator system, but a single letter suffix.

Small boats also have VK call signs but the prefix is followed by a series of numbers.

State police have a three letter call sign — VKC Melbourne, VKA Adelaide, VKG Sydney, VKI Perth, and VKR Brisbane. The Melbourne Metropolitan Fire Brigade signs VKN8 and there are other examples of VK call signs.

For additional information on Australian Amateur Station Call Signs and their history see an article "Notes on Call Signs and QSLs" in the *WIA Book Volume 1*, pages 52-55.

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Novice Notes

DIRECT CONVERSION RECEIVERS — Here to stay

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

The direct conversion (DC) receiver has been enjoying renewed popularity for some time now. This is due probably to the surprisingly good performance obtainable from relatively simple circuitry. To my knowledge, at least one manufacturer of amateur equipment; *Ten Tec*, USA, has produced a transceiver with a DC receiver section. As far as can be determined, the signal performance can equal, and in some instances exceed that of the more complex *superhet*. There is only one real disadvantage with DC; the *audio image* is very difficult to eliminate.

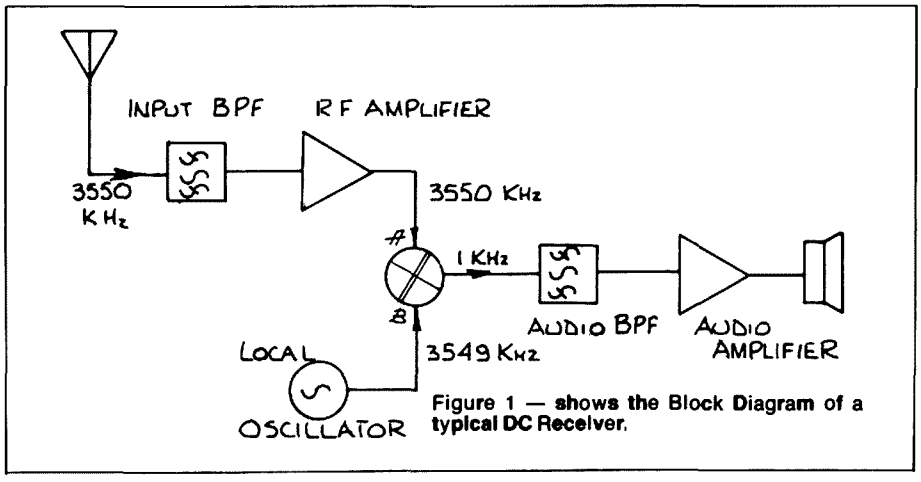


Figure 1 — shows the Block Diagram of a typical DC Receiver.

If an incoming frequency of say, 3.550 MHz is introduced to the product detector at input A, and a local oscillator LO (or beat frequency oscillator BFO) running at 3.549 MHz is introduced at input B; the sum and difference will appear at the output of the detector. The sum; 7.099 MHz is unwanted, and easily removed by filtering. The wanted product; 3.550-3.549 = 1 kHz is preserved, and is now available for further processing. This is where the term *direct conversion* comes from — the signal input frequency is *directly converted* to audio frequency.

An input band pass filter (BPF) is essential, as only the band of interest should be presented to the receiver. For example, without the filter, strong broadcast signals would enter the detector and probably cause severe overloading problems.

The RF amplifier is not a mandatory requirement, in fact some experimenters maintain that RF amplification is not necessary. Nevertheless, its inclusion will significantly improve the signal to noise ratio, and increase the overall sensitivity of the receiver. A gain which overcomes any loss in the product detector would be a minimum requirement. About 10 dB would be appropriate — any more and instability problems could occur unless very careful physical circuit layout is observed. There would also be a tendency for local oscillator energy to enter the input of the RF amplifier and cause some queer effects due to overloading, such as hum, squeaks and so on.

The audio band pass filter has a direct parallel with the tuned IF of a superhet receiver. This is where the necessary channel selectivity is obtained. The bandwidth will depend upon the reception mode required. For SSB, DSB and AM; a bandpass of perhaps 300 Hz to 3 kHz would be appropriate, whereas for CW, a bandpass of less than 500 Hz centred on about 1 kHz would be fine. In practice, to keep the receiver moderately simple, a bandpass of about 350 Hz to 2.5 kHz is employed for all modes.

Figure 2 is an attempt to show what happens as the local oscillator frequency is tuned across a portion of the 80 metre band. The cardboard cutout represents the bandpass of the audio BPF as it is moved across the signals (for clarity, all single constant frequencies).

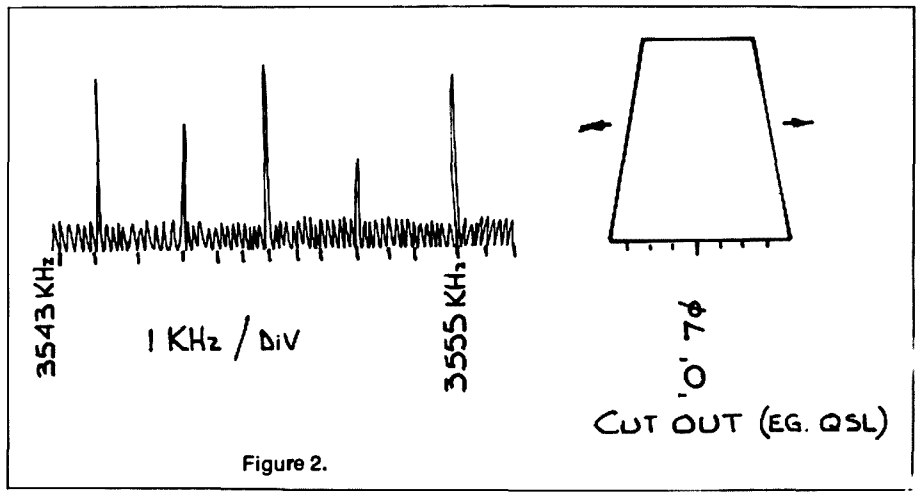


Figure 2.

The centre line represents the frequency of the local oscillator (OLO). It will be seen that it is possible to have more than one signal lying inside the bandpass simultaneously. For CW reception, this is not a big problem, as the oscillator may be adjusted to the same — or nearly the same frequency as that of the unwanted signal, leaving the wanted signal as the only audible one. The unwanted signal will now be at zero beat, or far below the low frequency cut-off point of the audio BPF, leaving the wanted signal plainly audible inside the bandpass. For SSB; an unwanted signal, on a different frequency but inside the bandpass would be audible — but unintelligible. Here the brain of the user must do the filtering. It can be shown that unintelligible interference is significantly less irritating than intelligible interference (even a stylish superhet would not eliminate an interfering signal on the same channel).

A characteristic which partly compensates for this short-coming is the 'cleanness' of the receiver response. This is very hard for me to describe. Suffice to say that signals have a purity about them, due perhaps to the simplicity of the circuitry, and the absence of multiple tuned circuits and their attendant noise impulse stretching characteristics.

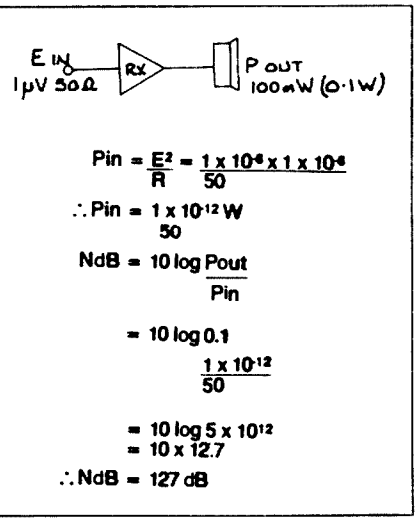
The bulk of the receiver gain must be provided by the audio amplifier. Some idea of the amount required can be shown as follows. Let's assume an input signal of 1 μV across the input impedance of 50 ohms, and a comfortable speaker power of say 100 mW:

The required 127 dB of gain could be made up of 10 dB of RF gain, perhaps 7 dB gain in an active mixer, leaving 110 dB to be provided by the audio amplifier.

Signals presented to the audio section have been derived by a minimum of processing (one RF amplifier, one mixer), so there is less likelihood that they will have become contaminated by the effects of non-linearities. Low noise opamps of the 308, 301 and 741 families are now relatively cheap and obtainable, so an audio BPF and high gain amplifier can be built very economically using very ordinary components, in contrast to the cost and complexity of an IF amplifier with all its coils and the need for alignment.

CONCLUSION

By following appropriate design rules, it is possible for the amateur to make a receiver of very satisfactory performance with a minimum of test equipment. An avenue for construction and experimentation is thus provided which offers both beginner and 'old hand' the opportunity to contribute to the art, even with limited means.



$$Pin = \frac{E^2}{R} = \frac{1 \times 10^{-6} \times 1 \times 10^{-6}}{50}$$

$$\therefore Pin = \frac{1 \times 10^{-12}}{50} W$$

$$NdB = 10 \log \frac{Pout}{Pin}$$

$$= 10 \log 0.1 \frac{1 \times 10^{-12}}{50}$$

$$= 10 \log 5 \times 10^{12}$$
$$= 10 \times 12.7$$

$$\therefore NdB = 127 dB$$

In a forthcoming article, we will present full construction details, including PWB layouts, for a DC receiver for 80 metres.

FURTHER READING AND REFERENCES

1. *Solid State Design for the Radio Amateur — ARRL.* This book, beautifully written by DeMaw and Hayward has become a standard work in the field of QRP, simple test equipment, receivers, etc.
2. *Practical RF Design Manual — DeMaw.* Published by Prentice-Hall; ISBN 0-13-693754-3. Despite the many typographical errors, is a valuable source covering a similar scope to (1) above.
3. *The "Mini-Monitor" Receiver — Dobbs G3RJV,* in *Short Wave Magazine,* March 1984. (Rev Dobbs consistently writes informative and entertaining QRP/DC receiver related articles for SW mag).
4. *The "Beer Mat" Receiver — Hopkins and Bolton* in *Radio Communications* magazine, July 1983.
5. *Keep it Simple — Direct Conversion Receivers — Pat Hawker G3VA* Conference on Radio Receiving Systems, IERE (London), 1978.
6. *High Performance DC Receiver — Diamond VK3XU,* in *Amateur Radio* magazine, March 1984.

Definitions:
Bandpass: You don't think the musicians pay to get in do you?
Superhet: A very powerful kind of radio with the capacity to bring in many stations — most of them twice. (Apologies to M G Scroggie)

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A Fiction Story, I Think . . .

Although I have been a radio amateur for 40 years, I'll never lose my love for shortwave listening. Tuning the 8-9 MHz band, for instance, is as much a thrill for me now as it was in my early years as a kid radio officer aboard a merchant tanker far at sea.

I suppose that is my explanation for so often carrying my little battery- powered shortwave receiver with me almost everywhere I go, that I can turn it on at any time to enjoy what the ether offers from so many exotic locations. Each time, it strikes me as a miracle anew, this ability to receive a distant signal propagated like it were a feat of magic beyond explanation. How many of us look at our hobby that way any more?

Well, to get on with it, one night I had fallen asleep with the earphones on, the receiver still playing a broadcast from 8.333 MHz into my ears. A strange signal, I had thought at the time, but I was tired and soon drifted off.

Hardly had I fallen asleep that I became aware of my dream, a dream in which I was walking along the cobble-stoned street of a city I quickly recognised as being Philadelphia — Market Street, in fact. I was well familiar with the spot.

But this was not 1986! No, not if the dress of those about me was an indication. They stared at my strange garb, just as I stared at theirs. Alongside me was a print shop in which a newspaper was pasted to the window. Quickly I searched for a date. June 26, 1792!

It was then I recognised myself being in a dream. This sort of dreaming is known as "lucid dreaming" in which the dreamer is not only aware of the dream but can also direct its ways. Fortunately, I have experience in lucid dreaming. I knew what to do.

Eagerly searching about me, hoping to make the best of every second of the dream, I sought to establish first hand exactly how our First Congress did, indeed, function. Thus, I turned my steps toward Independence Mall at Fifth and Chestnut Streets. I fairly trembled at the thought of seeing in person such American greats as George Washington, Benjamin Franklin, Thomas Jefferson and the others. What a rare privilege!

Heading east on Market toward Fifth, and south toward Chestnut, my quick steps brought me soon to Eighth Street where the tantalising aroma of freshly baked breads stopped me short in my tracks. Yes, aromas can be perceived by the subconscious mind in such circumstance, vividly so, I might add.

Stepping inside, I asked the price of a loaf and, being told it was three cents, shifted the receiver from my right hand to my left in order to extract change from my pocket. And then it struck me with all the impact of eternity unfolding before my very eyes — the receiver! I had it with me!

Can you imagine my dilemma? An eagerness to see the greatest personages of American history face to face, or a chance to hear if there were any signals crossing the ether at a time period more than 100 years prior to Marconi's first demonstration of the practicality of wireless communication?

We shortwave listeners never quit — I chose the receiver, stepping outside the bakery so as not to command attention.

Noting the dial to being yet set at 8.333 MHz, I held the receiver to my ear, reached for the power knob, turned it on . . . and, instantly, I heard "it," whatever it was. And then I was gone from that place.

That, my friends, is when I awoke. You see, my logical left-side brain had apparently attempted to assimilate a shock vastly beyond its capability, and to preserve my well-being it simply sent me back to reality, back to 1986 and my own bed.

But that I had heard a broadcast signal, I have no doubt. I am quite familiar with all the abnormal signals of a battery-powered radio, including the weak-battery squeal. I tell you, this was none of those — it *was* a broadcasted signal.

Often, these days, I think of 1792 and wish to be there again, but it has never come about nor do I anticipate it ever will. There is no clue remaining, neither to my conscious nor my subconscious, despite hypnotic regressions to search the past. Nothing at all, no clue, no hint at what it was that had so jarred my sensibilities that day, the something or other that was obviously so beyond my past life conditioning, beyond my range of acceptance. But, what?

I turn to all of you for help. What do you think it might have been, that radio transmission received on HF so many years before earth-men had even discovered radio?

Written by Vince Luciani K2VJ, for *CARI News* and contributed by Kevin Moore VK3ASM

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VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Japan*
52.013	P298PL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0SJ	*Macquarie Island (Keyer)*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Karratha*
52.325	VK2RHV	*Newcastle*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RBB	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.480	VK8VF	*Darwin*
144.465	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Karratha*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Karratha*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.475	VK3AQU	*Melbourne (Keyar)**
432.540	VK4RAR	*Rockhampton‡*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

* A letter from Ian Glanville VK3AQU, reads in part — "More than two years ago I built a 432 MHz beacon which operates from my parents home in a Melbourne suburb. This is a completely 100 percent privately owned and maintained beacon. It has now been in service continuously for at least two years. It has an output power of two watts to a clover leaf antenna. It is hoped in the future to increase power to seven watts and perhaps relocate it to the hills around Melbourne.

"The beacon operates to provide a signal in the 70 cm band to the amateur community around it and provide a valuable signal for calibration and tune- ups."

I have tentatively shown this beacon as a keyer but this may not be correct so I rely on Ian to advise me further as to its actual status. I believe there are other similar beacons around which are not listed. Provided these beacons are properly set up then I see no reason why they cannot be listed even if they are privately owned.

‡ Ted VK4JTW, has written confirming the operation of the Rockhampton 70 cm beacon which has CW identification. Power output at the moment is limited to 250 milliwatts due to being solar powered from the local two metre repeater. The antenna is a four by three element NBS Yagi, horizontally polarised, phased together and pointing north, south, east and west. Ted built the beacon and reports have been received from as far away as Bill VK4LC, with Harry VK4LE, hearing it almost every morning, also most of the time being heard in Mackay. The power will be increased as soon as the new repeater is installed later this year.

A LETTER FROM JAPAN

Kuni JA2TTO, has written from Shizuoka City, Japan, where he is Editor of the Six Metre Column in the *Mobile Ham* monthly magazine and has been since 1977. He has been a member of various DXpeditions, including the 4D88UT group to the Phillipines, YB0X (being the first six metre stations from Indonesia), YB9X Indonesia Bari and HS1WR/YL in Thailand.

Firstly, Kuni says the JA6YBR beacon I have been listing in not an authorised beacon as only JARL can set up beacons in Japan. However, they are trying to obtain permission to construct and operate beacons on 50, 144 and 432 MHz. Therefore, I have duly removed the station from the beacon list for the time being.

Also enclosed was a very neatly set out DXCC listing for countries worked on six metres and this will be included in the next listing which comes out in February 1987. As the list arrived too late for the August 1986 listing I am sure it will be of interest to readers to know that 48 countries are listed, made up as follows:

1. 7J1RL Okino-Tori-Shima 30/5/76 1057 UTC
2. VK3OT Australia 7/4/77 0815 UTC
3. JE1AHS/JD1 Ogasawara 1/5/77 1010 UTC
4. JD1YAA Minami-Tori-Shima 1/5/77 0907 UTC
5. HL9WI Korea 11/5/77 0910 UTC
6. KL7HAM Alaska 15/5/77 0255 UTC
7. KG6DX Guam 22/6/77 0200 UTC
8. P29HV Papua New Guinea 3/12/77 1628 UTC
9. 3D2CM Fiji 23/3/78 0647 UTC
10. YJ8KM New Hebrides 1/4/78 1023 UTC
11. FK8AX New Caledonia 23/4/78 0639 UTC
12. VS6HK Hong Kong 1/5/78 0241 UTC
13. CR9AJ Macao 1/5/78 0306 UTC
14. VK9ZR Mellish Reef 7/10/78 0932
15. KH6IJ Hawaii 3/11/78 0445 UTC
16. WA6JRA USA 28/2/79 0007 UTC
17. LU5EMM Argentina 2/3/79 0056 UTC
18. FO8DR French Polynesia 19/3/79 0832 UTC
19. KC6IN Eastern Caroline Islands 31/3/79 1111 UTC
20. PY1RO Brazil 12/3/79 0245 UTC
21. KG6RO Mariana Island 31/3/79 1422 UTC
22. KX6BU Marshall Island 26/4/79 1121 UTC
23. YB0X Indonesia 7/5/79 1131 UTC
24. C21NI Nauru 10/8/79 1107 UTC
25. HS1WR Thailand 1/9/79 1253 UTC
26. 5W1CF Western Samoa 13/9/79 1006 UTC
27. KC6SZ Western Caroline Islands 12/10/79 1417 UTC
28. ZL1AKT New Zealand 27/10/79 1102 UTC
29. VE7AXY Canada 18/11/79 0012 UTC
30. A35DX Tonga 9/5/80 0905 UTC
31. K9PNT/DU2 Philippines 3/3/80 1228 UTC
32. VK9XT Christmas Island 14/3/80 1226 UTC
33. N6DX/NH8 American Samoa 23/4/80 0916 UTC
34. VK9ZG Willis Island 25.7.80 1156 UTC
35. T3AZ Western Kiribati 17/9/80 1045 UTC
36. EL2FY Liberia 10/10/80 2358 UTC
37. VS5LH Brunei 17/11/80 0207 UTC
38. 9M6BE East Malaysia 30/11/80 0114 UTC
39. ZB2BL Gibraltar 23/2/81 0109 UTC
40. VU2JPN India 8/3/81 0516 UTC
41. KH3AB Johnston Island 21/3/81 0013 UTC
42. FW0BK Wallis Island 12/9/81 0901 UTC
43. H44PT Solomon Islands 15/9/82 1015 UTC
44. XU1SS Cambodia 22/8/83 0840 UTC
45. ZK2RS Niue 21/3/84 1005 UTC
46. BT5RA China 18/8/84 0022 UTC
47. ZL8AFH Kermadec Island 7/4/84 0242 UTC
48. Any station in Japan!

No doubt you will find it very interesting to go through this very impressive list and compare it with what you may have worked. Of interest too is that most of the more exotic contacts took place in 1978/79/80, with the peak year 1979. Based on the 11 year solar cycle, one could expect to start hearing long distance stations again around 1989 with a few even earlier. The equinoctial periods March/April and September/October seem to have provided the most contacts, a fact which was born out here too. There were 19 contacts on CW, the rest were on SSB. There were a few weak signal reports but most were shown as 5 x 9. All six continents are included.

The list of countries in the July 1986 issue, which had been worked by Graham VK8GB, includes a few not so far worked by Kuni JA2TTO, those being Lord Howe Island, Norfolk Island, Cocos Island, Venezuela, St Helena, Kenya, Nepal and Trinidad. It is interesting to reflect that there are still variations between two good locations and those extra worked by Graham are not necessarily at his back door.

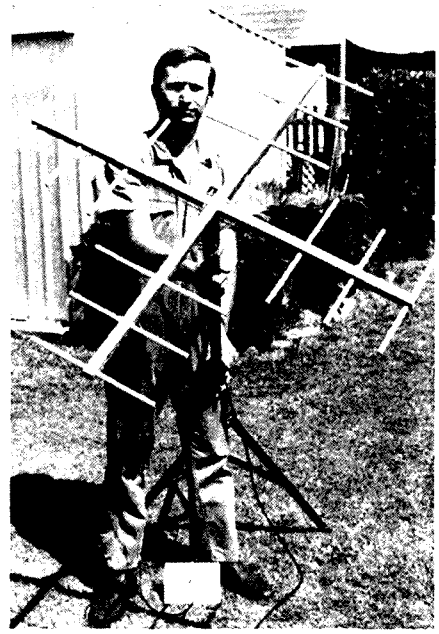
Other information tendered by Kuni mentions a new station from China on six metres, BY4RB, at Zhenziang, near BY4AA and operational from June 22, 1986, using a TR9300 and seven element Yagi after receiving instructions on VHF operation from JA1UT. As a result, BY4RB contacted about 1000 JAs on six metres between 22/6 and 26/6 on Es. BY1PK and BY4AA were both worked on 21/6 and 22/6.

From Korea the following are active on six metres: HL1IE, EJ, JD, PM, TS, AQK, AJY, ACK, ASS, HL2ICB, DCE, GS, HL4HAB, CCM, HL5BNV, BIT, HL0S.

Kuni has indicated he would like to exchange information with me so we should be able to learn more about what happens to our north where there are quite a number of countries with six metre operators.

NORTH QUEENSLAND

Ted VK4JTW, from Rockhampton, reports regular scheds are maintained to the west from Rockhampton on 144.200 at 2015 UTC, every day, between Harry VK4LE and Joe VK4AEW, with



Ted VK4JTW, with his 70 cm Beacon Antenna.

others calling in. Signals are usually around 5 x 5 on two metres and 5 x 2+ on 70 cm.

Regular stations on SSB include VK4AEW, VK4LE, VK4KTA, VK4TPK, VK4KAL on two metres with VK4JTW and VK4ZHL on both two metres and 70 cm. Further north at Mackay, there are VK4AIV, VK4AIM and VK4ALW on both bands.

On weekends, Ted VK4JTW and Errol VK4ZHL, are on to Brisbane on 144.350 and 432.350 MHz from 2030 with 3.620 MHz as back-up. Signals to Angus VK4AGQ, range from 5 x 3+ to no copy on bad days on both bands. Tony VK4AJB, is a regular on 70 cm to Rockhampton with signals 5 x 3 to 4 x 1 from Gympie. Contacts to Mackay range from 5 x 5+ on 432.100, one watt FM, but mostly 5 x 1. SSB high power with Wally VK4AIV, means regular contacts.

VK4AEW uses a TR9000 with pre-amplifier and 100 watt home-brew valve linear into two nine element Yagis. At VK4ZHL a TR9130, with Microwave Modules pre- amplifier and 160 watt linear into two 13 element quagis on two metres, on 70 cm a TR9500 to 100 watt linear and 15 element quagi. VK4LE has a HL160V into five by five element Yagis on two metres and a TR9500 into a HL90U linear, 10DFB cable and four 11 element Yagis on 70 cm. Wally VK4AIV, has a 25 element loop Yagi fed by heliax from a IC471H on 70 cm and IC271H on two metres.

The station of VK4JTW on two metres has a FDK750 into 150 watt home-brew valve linear with 12 element NBS Yagi and masthead pre-amplifier, on 70 cm a TR9500 into MRF646 home-brew amplifier giving 40 watts into a 23 element DL6WU antenna fed with 10DFB. Ted is making three more DL6WU antennas as well as a 4x150A coaxial linear for 70 cm and hope to have an output of about 175 watts.

OVERSEAS

The Short Wave Magazine for May 1986, courtesy Steve VK5AIM, reports amongst other things, the 156 mph gust of wind recorded in Scotland on March 20, 1986 and further south at Luton airport of 88 mph. Much destruction of antennas occurred, naturally. I would hope never to ask my antenna system to withstand 156 mph winds!

In the same month, the RSGB National VHF Convention was held at Sandown Park Racecourse with an attendance around 3000! No wonder the comment was made that at times it was necessary to fight your way to the various stalls.

Much interest centred around the equipment available for 50 MHz now that the band has been made available to the G-stations. Of particular interest was a new MMT50/144 transverter which needs between 150 mW and 15 watts to drive it and gives an output power of 20 watts. Used with a 7 dB antenna gain this gives the maximum licenced ERP presently permitted. The suggested price was £145 and was in direct competition with the muTek TVVF50c currently offered there at £209.90. I wonder if we will see any of these units in Australia?

A comment from the same magazine was that the six metre band so far had proved it is much easier to work stations via meteor scatter and aurora than it is on two metres. However, tropo propagation is much poorer. For example, G4FRX, in Hampstead, regularly works G4OAE, in Reading, on 70 cm using a few watts, signals being rock steady and very strong. But on six metres signals are weak and always accompanied by lots of noise, even though the distance is only about 50 km. The general conclusion is that six metres is the noisiest VHF band with thermostat and motor commuter hash, and all the domestic clicks and bangs peaking around 50 MHz. "Perhaps this explains why so few stations are using the band now that the initial novelty has worn off."

Whilst I concede six metres can be relatively noisy, I do question why better results are not being obtained from "two stations both well sited with a relatively clear path and only 50 km apart." There must be something wrong at one or both stations for poor reports to be obtained over such a short distance from good sites. VK5LP, can put an S9 signal into Adelaide over a similar path distance with three watts from my relatively poor location. With 20 watts it should be a push-over at 50 km for S9+ signals on six metres so another look at their antenna systems might be in order if the other equipment is working satisfactorily, especially so, since they both have good sites. The other factor is that it is a new band to these people and they still have to get their acts together for best results.

The Annual VHF/UHF Table for operation between January 1, 1985 and December 31, 1985 showed G0CUZ as having worked 16 countries on two metres with four other stations working 14; on 70 cm G1KDF worked six countries and G4NBS worked seven; on 23 cm G1KDF worked three countries. These were the top scorers in a listing of 24 participating stations. G4SFY, had 130 CW contacts on two metres.

IC551D MODIFICATION

For those of you who have an IC551D (and I presume the lower power IC551) you may be interested in a modification to the noise blanker which is supposed to affect quite an improvement. The tip is published in the SMIRK *Six Shooter* newsletter of May 1986 and came originally from KLM Electronics.

1. Break apart Q13 exposing leads that go to the PC-board.
2. Using a 2N2222 with leads cut short, connect it to the leads where Q13 was.
3. Cut the long lead of R86 leaving enough lead so another resistor can be soldered in series with R86.
4. Connect an 82 ohm half-watt resistor in series with R86.
5. Using a signal generator tuned to 50.100 MHz connected to the IC551 input — adjust L25, L23, L22, L21 and L20 for maximum S-meter reading.
6. With the IC551D connected to an antenna adjust L19 and R65 for the best noise blanker operation. R65 can be pre-set at half-turn.

With my IC551 I found the adjustment of R65 to the optimum point when power line hash is at its worst did make an improvement in the ability of the rig to lower the noise level in most cases. (This was a separate operation and nothing to do with the above modification). However, due to one particularly bad insulator on the 22 kV line outside my shack during our long dry summer last year eventually the noise blanker was unable to cope so contacts on six metres were wiped out. I substituted my trusty old TS600, which I use for portable operation and the superior blanker in that equipment enabled me to carry on satisfactorily on the band. It grieved me to have to resort to this as all other points about the IC551 are so good but why they cannot produce a blanker as good as the one in the TS600 is beyond me. However, before this summer, I will try the above modification and let you know what the result is. In the meantime, of course, the Electricity Trust has been good enough to replace the offending insulator and clean all the others so it may need a very hot day before the level rises high enough for problems to occur this year! Incidentally, before the substitution of the TS600 the power leak was reading S9 +30dB on the IC551 and a few minutes later on the TS600 it was S2 (or S9 + 30 with the noise blanker switched off, so there was no change in the actual conditions).

If any reader does make this modification I would be pleased to hear what results you obtained so I can pass the news along.

THE ROSS HULL MEMORIAL CONTEST

Quite a degree of activity has been taking place in various quarters in an effort to keep the Ross Hull Contest alive. As you know, it has come under threat of extinction by the Federal Contest Manager due to lack of log submissions, etc.

The FCM sent a circular to a number of interested parties, including myself. As a result, I have made a number of interstate telephone calls and posted out suggestions for possible improvements and there has been some interesting feedback, and a few of the main points are set out below.

1. There seems little doubt one of the main inhibiting factors causing most operators not to send in logs are the stations operating on six or more bands. No one talks disparagingly about these stations, in fact, they command the dedication necessary to achieve this situation and the effort required to fire-up on so many bands with such consistency, that they do in the Contest. But not everyone can achieve this status for a variety of reasons so what we are hearing is why can't we have a contest in which there is a more even chance for the maximum of stations? If the contest for the trophy was limited to 52, 144 and 432 MHz with bands above being able to operate for a certificate in each call area, then it would get back to something like it was years ago when there was a much higher return of logs. In other words, years ago almost no one had equipment for 1296 and above, so it was, by nature, limited to those three bands anyway.
2. The one point per contact irrespective of distance did not go down too well either and certainly it did not recognise that there are stations 2000 km and further with whom it would not be easy to make a contact particularly on two metres so it was easier to ignore such operators and stay on six metres. But operators nevertheless still want a relatively easy scoring table.
3. The bonus system failed because it was more valuable to go for prefixes than attempt to work stations in areas already worked. Something which gave a bonus after, say, every ten contacts would tend to keep people on the air.
4. Some thought no contacts should be permitted under 50 or 100 km. This does have some merit if applied across the whole spectrum of bands, but up to 70 cm it could be unfair in a situation such as, with a 50 km limit, you had one station at 60 km from a metropolitan area, he could work perhaps 50 stations in that area, but those stations residing in the metropolitan area each could only work the one station. So the lone station would score say 50 points for his work and the others one point. On the other hand, they would be free to work stations elsewhere!
5. Some recognition was needed for working stations on other countries or the islands of the Pacific. If these operators from ZL, P29, H44, FK8, etc are good enough to come on and provide contacts then they and the operator working them need to receive more than one point. Five points per contact on six metres to these stations would not be considered unreasonable. Likewise, contacts over 2000 km across the Australian mainland should have some consideration too — often they are not easy.
6. Some doubted the need for a score taken over the full Contest period saying that a seven day and two day section would suffice. It was pointed out that stations would still stay on the maximum time they could because with Es contacts, one cannot predict what is going to happen on the VHF bands, therefore you need to be on to arrive at your best seven day score.

That summarises the main points arising from correspondence and discussions. I will now be taking the matter up with the FCM in an endeavour to ensure the Contest is available to us this year. At the same time, I expect you, the operators, to play your part by submitting a log and not cut the ground from under my feet. I don't have much to stand on if there are only a few logs, as last year. The FCM advises me that from the log entries he received, there were only about 60 VHF stations which had operated on the six metre band. The copies of the logs of the stations from whom I had requested revealed there were 402 separate call signs from VK1 to VK8 inclusive. There were 166 call signs on two metres. The breakdown of this information I published in March 1986 *Amateur Radio*. These figures show a great deal of interest, but this was not reflected in the log returns.

If the Contest has its main feature as being of seven days duration then no one needs to be too concerned if you work someone who gives you a score exchange which indicates he may have worked 500 stations. Because he selects his best seven days you may have just as good a chance.

On getting the logs ready for the FCM, why not do as I do and write your log entries in your log book neatly and then photocopy them after which you can add the extra details such as scoring, etc before submitting them to the FCM. It is unlikely you will be working stations any time at such a furious rate that you cannot keep your log book neat. A little time spent during the Contest will

save you much time later, especially if you have a good score. But ***please*** — enter the log. (If you use a black pen photocopies are much darker and easier to read. Blue does not photocopy well).

FINALLY

There is not a lot to report on the overall winter time activity on our bands. There seems little point in reporting general day to day contacts and I have not heard of anything too spectacular o far this month! I have a very annoying problem in that my two metre rotator is frozen in a south-easterly direction and all efforts from the ground have so far failed to free it. David VK5KK, climbed up 70-odd-feet recently and reported everything looked okay but as it was very windy we could do no more. I am hoping the warmer weather of approaching summer might free it, in the meantime, I have to be content with using the system to monitor VK5RSE, the beacon in Mount Gambier, on 144.550 MHz!

Closing with two thoughts for the month: *Inflation is prosperity with high blood pressure* and *Advice is like mushrooms. The wrong kind can prove fatal.*

73 The Voice in the Hills.
ar

VHF/UHF RECORD CLAIMS

A number of VHF/UHF distance record claims have been received by FTAC over recent months. Because of the workload leading up to the Federal Convention, analysis of these applications has only now commenced.

Initial analysis of the claims shows the following:

CALLS	BAND MHz	DATE	DISTANCE	RECORD
1. VK7DC/VK5LP	432	Jan 11, 1985	918 km	VK5/VK7 record
2. VK7JG/VK5NY	432	May 21, 1985	995 km	VK5/VK7 record
3. VK5ZEE/ZL1HH	144	Jan 15, 1986	3458 km	VK5 State record
4. VK3KAJ/VK3ZBJ	3300	Jan 25, 1986	246 km	Australian record
5. VK3KAJ/VK3ZBJ	10000	Feb 8, 1986	262 km	Australian record

Once final verification is made, these applicants will be formally advised of the status of their record applications.

In addition, claims have been received from Wally Green VK6WG, and Brian Usher VK5KBU. Unfortunately, in both cases, insufficient information has been received to make the necessary analysis and verification possible. These applicants have been contacted to obtain the extra details necessary.

Any Intended applicants for VHF/UHF records are urged to include all details specified on page 143 of the 1985-1966 Call Book. Such will ensure early verification and public recognition of the record.

Ray Roche VK1ZJR, VHF/UHF Claim Recorder, Federal Technical Advisory Committee.

Contributed by Peter Gamble VK3YRP

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

SEPTEMBER

- 7	LZ DX Contest (Rules this issue)
8- 7	Tenth WA Annual 3.5 SSB Contest (Rules August issue)
13-14	European Phone Contest (Rules August issue)
20-21	Scandinavian CW Activity
27-28	Scandinavian SSB Activity
27-28	1986 Californian QSO Party (Rules this issue)

OCTOBER

4- 5	VK/ZL Oceania Phone Contest (Rules August issue)
4- 5	IRSA World Championship
11-12	VK/ZL Oceania CW Contest (Rules August issue)
-12	RSGB 21/28 MHz SSB Contest
15-17	YLRL Anniversary CW Party
-18	RSGB 21 MHz CW Contest
18-19	1986 Fall CW Contest (Rules August issue)
18-20	CARTG RTTY Contest
25-28	CO WW DX Phone Contest
29-31	YLRL Anniversary SSB Party

NOVEMBER

- 8	Australian Ladies Amateur Radio Association Contest (Rules this issue)
8- 9	European RTTY Contest (Rules August issue)
29-30	CO WW DX CW Contest

ALARA CONTEST

Well, here is the big event on the YL calendar and I certainly believe that all OMs should note this contest as well.

The rules have been provided to me by Marlene VK2KFQ, and I thank her for same. The ALARA Contest should be a friendly event and I hope that all will provide it with the support that it deserves. It will also provide chances for gaining some of those special awards for which YL contacts are needed.

I see that my compatriot, Frank W1WY, of *CQ* magazine fame, has also publicised this contest in his column. I wish all who enter an interesting and enjoyable contest and hope to find some time to enter myself. Further, I would remind ***all Australian YL Novice Operators*** of the Florence McKenzie CW Trophy. Check the rules properly for details.

It is of note at present that we have, here in VK5, a YL operator, Jennifer VK5**A**ustralia's **N**icest **W**oman, as our Divisional President. So, go to it Jennifer, in this special year for the VK5 Division. I know that you will have at least all the VK5s backing you to win the Contest!

CONTEST DATES FOR 1987

I have now allocated dates for the forthcoming year in accordance with prescribed guidelines. I trust that in doing so I will have been able to stay clear of any major overseas HF contests. However, I have no real way of telling. It is necessary that thee dates be set at about this time for various reasons. Details are as follows:

Ross Hull Memorial VHF Contest, 1966 — December 13, 1986 to January 5, 1987
John Moyie Memorial Field Day Contest — March 14-15, 1987
VK Novice Contest — June 27-28, 1987
Remembrance Day Contest — August 15-16, 1987

I would presume that the VK/ZL Contest will be held as usual on the first and second in October.

It should be of interest that as a result of negotiation with Jock White ZL2GX, who is the NZART Contest Manager, agreement has been reached that the ZL Field Day Contest will be conducted on the same weekend as our Field Day. Also, that it is likely that the ZL Memorial Contest will coincide with our Remembrance Day Contest. Discussions which have taken place make it appear quite feasible for both VK and ZL stations to operate simultaneously in virtually both contests using common scoring exchanges. This will require only minor changes or additions to our contest rules and should be of benefit to all operators. It may also attract added interest in these contests. Further details will be made available when the rules have been finally approved and are ready for publication. I would like to express my thanks to Jock for his great tolerance and patience whilst we negotiated these matters. It is a fact that he was prepared to make the maximum of changes to meet this desirable state of affairs whilst I was probably just my usual stubborn and inflexible self. (Actually, all it took was a motor car drive around Adelaide and one free meal to bribe him whilst he was here. Then again, on second thoughts, maybe my driving scared him so much he was frightened to say no!).

The subject of rules for the Ross Hull Contest, as well as the future of same has been under close scrutiny. A great deal more feedback is needed from members than has resulted so far from the Discussion Paper which I have circulated, before we can come to any rational decision as to the prevailing opinions. At the same time, several persons have been working to try and devise a set of rules which may suffice for the present. If the modified rules can help increase interest in the Contest, well and good. If not, then something will have to be done about the situation. No matter which road one takes however, it will never be that everyone is pleased with the rules for contests.

I would ask that you do please continue to send in your comments connected with contest matters. Whilst I cannot undertake to reply to all letters I can assure you that your comments, for and against, are appreciated.

You may have noticed a mistake in the headings for the results of this year's *John Moyle Memorial Field Day Contest*. The results for the ***six*** hour section were headed eight hour. This was a mistake and I can assure you that there is no intention to vary the six hour period which has proven popular for a number of years.

Incidentally, earlier in these notes I mentioned the name of Frank Anzalone W1WY. Frank provides me with regular copies of his contest material and I know that he sends out the same to over 20 organisations around the world on a personal voluntary basis, and at no profit. Frank has been with *CQ* magazine for over 30 years. That could be some kind of record.

HF CONTEST CHAMPIONSHIP

I have great pleasure in finally announcing the winners of this competition for 1965. I have scored the results on the basis of the rules as published in the August issue of *Amateur Radio*. This means that for the first time we have separate Contest Champions for the Phone and CW modes. I have provided details below in which, although to qualify for the competition entries need to be made in *three* of the four applicable contests, I have included scores where entrants have points in two or more. There were quite a few stations who scored high points in just a single contest. If some of these stations, particularly novice stations who did well in the VK Novice Contest were prepared to enter in the Field Day and Remembrance Day Contests, we could see some quite interesting results in this particular competition.

Congratulations are due to ***Bob VK5BJA***, for his win in the Phone Category, and particularly to ***Jim VK2BQS***, for top scoring in the CW Category. Both operators always have submitted good logs and Jim has been a most consistent entrant in contests for a number of years.

I have not at this stage completely sorted out

matters concerning the main trophies as yet. However, both entrants can expect to receive their smaller individual trophy for their retention in due course. The existing trophy has to be sent for refurbishing whilst the second trophy has yet to be obtained.

CALL SIGN CONTEST AND TROPHY POINTS

	JM MFD	Novice	VK ZL	RD	Total
					PHONE CATEGORY
5BJA	10	10	—	10	*30*
2KL	—	9	10	10	*29*
5QX	10	9	—	9	*28*
2BQS	—	6	10	—	*16*
3ADW	9	—	—	3	*12*
1LF	—	—	8	3	*11*
4BKM	—	—	6	4	*10*
					CW CATEGORY
2BQS	10	9	7	—	*26*
2PS	—	10	10	—	*20*
5AGX	—	10	—	9	*19*
4XA	—	—	8	10	*18*
5GZ	—	9	2	6	*17*
3KS	—	8	8	—	*16*
3RJ	—	—	9	3	*12*

The observant amongst you may have noted an anomaly, in that Lindsay VK5GZ, actually took second place in the CW Category with his 17 points as he was the only station entered apart from VK2BQS, who scored in three of the four contests.

Finally, in my notes for this month, I wish to acknowledge the receipt of correspondence from Robb VK4TKA, Eric L30042 and a letter I had inadvertently overlooked from Ewen VK3BMV. This latter I will reply to as soon as possible. I also received another very nice letter from Arthur Mead, of Bexley, NSW.

As these notes are written, there is just over a week to go to the closing date for the VK Novice Contest. Logs have been rolling in at a pretty fair rate and a quick preview of comments indicates that it was possibly one of the most satisfactory Novice Contests so far conducted. It would appear that the time of the year finally achieved for this contest is right.

I hope that you had a good time operating in the Remembrance Day Contest and I am looking forward to having exchanged serial numbers with you in the contest. Meantime, my greetings to you. I trust that all your antennas have managed to weather the winter storms and have not deteriorated too much from the cold and wet. Best 73 de Ian VK5QX.

ALARA CONTEST

ELIGIBILITY — All licenced operators throughout the world are invited to participate. The Contest is also open to SWLs.

OBJECT — The object of the contest is participation! YL works everyone, OM works YLs only. One contest (combined phone and CW) run over 24 hours.

PERIOD — Starts 0001UTC Saturday, November 8, 1986 to 2359UTC Saturday, November 8, 1986.

SUGGESTED FREQUENCIES — bands to be used are: 3.5, 7, 14, 21 and 28 MHz only. The following are suggested frequencies for easier location of contacts.

PHONE	CW
28.480-28.520 MHz	28.100-28.200 MHz
21.180-21.200 MHz	21.100-21.200 MHz
21.350-21.370 MHz	14.050-14.060 MHz
14.180-14.200 MHz	7.010- 7.020 MHz
14.280-14.300 MHz	3.525- 3.535 MHz
7.100- 7.120 MHz	
3.570- 3.590 MHz	

OPERATION — Phone and CW operation. Each station may be counted twice on each band for credit: once on phone and once on CW. All contacts must be made in accordance with operator and station licence regulations. No net or list operation, no cross-mode.

PROCEDURE — Phone: Call ***"CQ ALARA CONTEST"***. CW: Call ***"CQ TEST ALARA"***.

EXCHANGES — ALARA member: RS or RST, serial number, starting at 001, ALARA member, name. YL non-member or OM: RS or RST, serial number starting at 001, name.

SCORING —

Phone: Five points for each ALARA member contacted. Four points for a YL non-member contacted. Three points for OM contacted.

CW: Double all points for CW contacts.

SWL: Five points for ALARA members logged. Four points for YL non-members logged.

LOGS — Single log entry (but Australian YL Novices entering for the Mrs Florence McKenzie CW Trophy should indicate their CW score separately, also). Logs must show date/time UTC, band, mode, call sign worked, report and serial number sent, report and serial number received, name of operator of station worked, and points claimed.

SAMPLE LOG

Date Time UTC 8/11	Band MHz	Mode	Call Sign	RS/T & Serial No Sent	RS/T & Serial No Rec	Name	Point
0135	28	SSB	VK3KS	59001	59002	Mavis	5
0138	21	CW	VK2EBX	599002	590010	Joy	10

LOGS MUST BE SIGNED — Logs to also show full name, call sign and address of operator, and show final score (points claimed). Logs must be legible. No carbon copies. No logs will be returned. Decision of the Contest Manager will be final. Logs must be received by the ALARA Contest Manager by December 31, 1986.

CONTEST MANAGER — ALARA, 31 Cadell Street, Wentworth, NSW. 2648, or PO Box 4, Middle Brighton, Vic. 3186.

A TROPHY — Will be awarded for the highest aggregate score over five years (commencing 1983) of a licenced YL operator (not necessarily Australian.

MRS FLORENCE MCKENZIE CW TROPHY — This will be awarded to the Australian YL Novice operator with the highest CW score (not necessarily an ALARA member). Minimum score 50 points. The actual trophy, because of the size and weight, will not be forwarded to the winner, but a certificate bearing a photo depicting the trophy, will be sent to the winner each year.

CERTIFICATES — Will be awarded for the following:

Top overall score
Top score Australian YL Novice (Mrs Florence McKenzie Certificate)
Top ALARA member score in each country and VK call area
Top YL non-member score in each Continent
Top OM score in each Continent
Top SWL score in each Continent
Top VK Novice score
Top Overseas YL Novice score — CW

(Mrs Florence Violet McKenzie, 1892-1982, was the first woman in Australia to take out a transmitting licence, in 1921. She passed the Amateur Operator's Certificate of Proficiency in 1925, and obtained the call sign 2GA, later VK2FV. Mrs Mac taught Morse code to thousands of people, particularly service personnel, during the 1939-45 war years. In 1984, the Townsville Amateur Radio Club kindly donated a trophy in her memory).

1986 CALIFORNIAN QSO PARTY

Sponsored by the Northern Californian Contest Club

The Contest is held from 1600 UTC, September 27, 1986 to 2200 UTC, September 28, 1986.

Single operator entries may operate only for 24 hours; off times must be clearly marked in your log and must be at least 15 minutes long.

Multi-operator entries may operate for the full 30 hours.

Stations may be worked once on CW and Phone on each band.

All contacts must be simplex, no MCW.

All CW contacts must be made in the CW subband, except for 160 metres.

Californian stations that change counties are considered to be new stations and may be contacted again for point credit.

OBJECT — Stations outside of California work as many Californian stations in as *many* Californian Counties as possible; stations in California work anyone.

EXCHANGE — Californian stations send a QSO number and county, stations outside California send QSO number and State/province/country.

QSO POINTS — Each complete phone contact is worth two QSO points. Each complete CW contact is worth three QSO points.

MULTIPLIERS — Stations use the number of different Californian Counties for a possible total of 59.

TOTAL SCORE — The total score is the number of QSO points multiplied by the total number of multipliers.

FREQUENCIES — 160 metres through to two metres, excluding 30 and 12 metres. CW on 1805 and 50 kHz up from the band edge. Phone on 1.815, 3.850, 7.230, 14.250, 21.300 and 28.500 MHz.

Try CW on the half hour, 160 metres at 0500 UTC and 80 metres at 0700 UTC.

LOGS — All logs and summary sheets must be sent to NCCC, c/- Gary Caldwell WA6VEF, 1830 Polk Street, Concord, CA. 94521, by November 1, 1986. Please include a business size SASE for results. Entries of more than 200 QSOs must include duplicate sheets.

AWARDS — Certificates to the highest scoring single operator entry in each country and each station that scores 100 or more QSOs. Trophies will also be awarded.

LZ DX CONTEST

The Bulgarian Federation of Radio Amateurs invites amateurs world-wide to participate in the *LZ DX Contest*.

The contest is held on the first Sunday of September from 0000 to 2400 UTC. (September 7, 1986).

BANDS and MODES — 3.510-3.560; 7.000-7.040; 14.000-14.060; 21.000- 21.080; 28.000-28.100 MHz, CW only.

CATEGORIES —

a) Single operator all bands
b) Single operator one band
c) Multi-operators, club stations, all bands only
d) SWL.

EXCHANGE — RST and ITU zone of the transmitting station.

POINTS — Each confirmed QSO with an LZ station is six points. One point for a QSO with stations in the same continent. Three points for all other QSOs. One station may be worked only once per band.

MULTIPLIER — The sum of the number of ITU zones on each band.

FINAL SCORE — The sum of the QSO points from all bands multiplied by the final multiplier.

SWL — Three points for two call signs and two numbers; one point for two call signs and one number.

LOGS — In standard format, separate logs are required for each band. Summary sheets showing zones worked on each band and a declaration are required. Send logs not later than 30 days after the contest to: Central Radio Club, PO Box 830, Sofia 1000, Bulgaria, Europe. The postmark will be decisive.

Awards in the form of medals will be awarded to the winners.

Logs may be accompanied with an application for the BFRA Awards — NRB, W- 100-LZ, Five-Band LZ, W-28 Z ITU, Black Sea Award and the Sofia Award. (See Awards Column for details of these awards).

THE 28th SCANDINAVIAN ACTIVITY CONTEST 1986

CW: September 20, 1500 UTC to September 21, 1800 UTC.

Phone: September 27, 1500 UTC to September 28, 1800 UTC.

Logs to: EDR Contest Manager, Leif Ottosen OZ1LO, Bankevejen 12, Kong, DK-4750 Lundby, Denmark.

Aims: To encourage activity on the part of Scandinavian and non- Scandinavian amateurs to work each other and to promote communication skills between amateur stations world-wide. Non-Scandinavian stations will try to work as many Scandinavian stations as possible.

Scandinavian stations are defined by prefixes as follows: LA, LB, LG, LJ Norway; JW Svalbard and Bear Island; JX Jan Mayen; OF OG, OH, OI Finland; OH Aland Island; OH0M Market Reef; OX

Greenland; OY Faroe Islands; OZ Denmark; SJ, SK, SL, SM Sweden and TF Iceland.
Eligible Entrants: Radio amateurs as well as SWLs world-wide are invited to participate.
Sections:
a. Single Operator/Single Transmitter/All bands only and Single Operator/Single Transmitter/All bands QRP. A single operator is one person performing all operating, logging and spotting functions. QRP operators may use stations with a maximum input of 10 watts.
b. Multi-Operator/Single Transmitter? All bands only. Only one signal allowed at any time on any band. The station must remain on the band at least 10 minutes after the first QSO on that band after a band change.
c. SWL. Only single operator/All bands. Log must contain Date, Time UTC, Band, Scandinavian Station Heard, Message Sent by Scandinavian Station, SWLs own report, Station Worked by Scandinavian, Multiplier, Points. Only Scandinavian stations may be logged for points. Scoring as for transmitting sections.
Bands: 3.5, 7, 14, 21, 28 MHz according to IARU Band Plans. NOTE: 3.560-3.600; 3.650-3.700; 14.060-14.125 and 14.300-14.350 Mhz must be kept free of contest traffic.
Exchange: Consists of RS/T plus serial number beginning at 001. QSOs after 999 are numbered 1000, 1001, etc. The same station may be worked once on each band. Only CW/CW and Phone/Phone OSOs are valid.
Scoring: Two-way OSO with a sent and received exchange counts for QSO points. Stations credit their log with one point for every completed Scandinavian QSO on 14, 21, 28 MHz and with three points for QSOs on 3.5 and 7 MHz.
Multipliers: Worked call-number areas (0 to 9) are valid on every band in each Scandinavian country. Portable stations without a district number counts for the 10th area; eg G3XYZ/LA counts for LA0. OH0 and OH0M are separate call areas. SJ9 counts for the ninth call area in Sweden; eg SM3-SK3-SL3 count as one multiplier — not three multipliers on each band).
Final Score: Multiply the sum of QSO-points on all bands with the sum of multipliers worked on all bands.
Logs: Must be post-marked no later than October 30. Signed original logs, or copies of original logs, must be submitted separately for CW and Phone. Logs to be filled out in the following order: Date, Time UTC, Station Worked, Sent and Received Exchange, Band, Multipliers; (eg OZ4, SM3, OH0, etc) and points.
SWL log must contain: Date, Time UTC, Band, Scandinavian Station Heard, Message Sent by Scandinavian Station, SWLs own Report, Station Worked by Scandinavian Station, Multipliers and Points.

All entrants must contain a summary sheet showing station call sign, category, name of operator/s and address. Indicate number of QSOs per band less duplicates, number of duplicates per band, multipliers per band, QSO points per band and final score.

All entrants must also supply a multiplier sheet for each band with more than 200 QSOs.

Possible duplicate QSOs must be shown in the log and count for zero points. Each entrant must submit a duplicate QSO sheet for each band with more than 200 QSOs.
Declaration: By his/her signature on the summary sheet the participant declares that all rules are observed and that the station was operated in accordance with the rules and regulations for amateur radio stations in the country of the participant.

Usual contest disqualification criteria applies.

Top scorers in each country will receive awards and certificates, etc.

The 29th SAC in 1987 will be organised by the SRAL, Finland.

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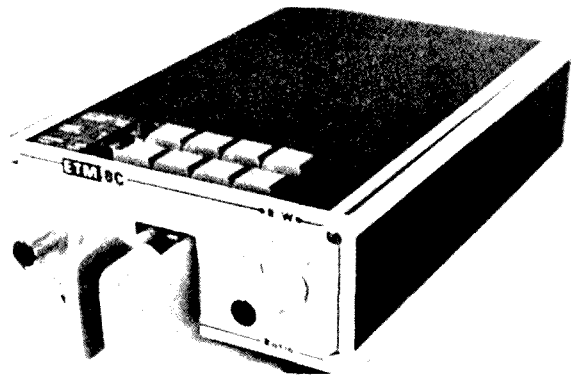
ELECTRONIC KEYERS



Photograph courtesy *Keylink Imports* (see advertisement page 55)

Gil Griffith VK3CGG
7 Church Street, Bright, Vic. 3741

The many inquiries I have had after the article on the ETM-8C keyer in July AR has provoked me into a better explanation of electronic keyers as I have found them.

I will attempt to put my meagre two years of learning about them into this article, but it will be in plain English translation as I am still having trouble following the logic circuits and, although I have built one accu- keyer (see the *ARRL Handbook*), I have trouble wading through the circuitry to find out exactly how it works.

BASIC MORSE

Using the length of a dot as a base, the length of a space between elements should be one dot length. The length of a dash should be three dots, spaces between letters should be three dots, and spaces between words should be five (or more) dot lengths.

If a signal has its dots and dashes too long with respect to the spaces between them it is said to be weighted. But it is sometimes called the dot- dash ratio, where the dash is longer than three dot lengths.

The main effect of weighting is that the dots sound much shorter than unweighted Morse at the same speed.

Incidentally, the length of the dot varies from 200 milliseconds at five words per minute, down to 40 mS at 30 WPM, and only 20 mS at 60 WPM.

The main reason for using an electronic keyer is that it is *easy*. There are a few steps from the hand pump to the electronic keyboard and they probably all stem from people wanting an easier sending method. After the straight key there were numerous mechanical keys which usually involved a weighted spring to give a short series of dots, with a manual key for the dashes.

The most basic electronic key has a series of clocked pulses (dots) available by pressing the paddle to the right, the dashes would still be generated by pushing the paddle to the left for the required time. This type of keyer is readily available today and sometimes has an automatic dash where you can hold the dash paddle on and get a string of dashes. It is also usual to find a speed control at this level.

The next model electronic keyer has two paddles spaced about 10 mm apart so that the digital circuitry can be designed to give *iambic* operation. Iambic is when you press both paddles at the same time and get didahdidahdidahdidah . . . etc. If you want dahdidahdidahdidahdi, you must squeeze the dah paddle first. Depending on when you let go, you will end in either a dit or a dah. With this type of keyer you can also send a series of dits and, without removing your thumb from the dit paddle, you can insert a dash by tapping the dash paddle at the appropriate time. This is useful when sending F or L. Conversely, a dot can be inserted into a string of dashes in the same way for the letters Q and Y.

DOT-DASH MEMORY

Most keyers have this feature. It means that if you squeeze the key quickly you will get either an R or K depending on which you squeeze first. What happens is: even while the circuit is generating the first dot and dash, it remembers that both the paddles were pressed together for a small amount of time, so it inserts a dot after the dash, you were probably letting go of the paddles while the dash was being generated. With the dot- dash memory disabled you would get an A instead of the R, and the timing of the squeeze will be very critical if you want an R. This is because you have to open the paddles after the last dot starts, but before the next dash starts, we are talking milliseconds here.

If you want an A, etc, you must flick each paddle separately when the dot- dash memory is operating, but this is much easier than trying to get the timing right with the dot-dash memory disabled. Anyway, the disabling of the memory requires *more* components.

AUTOMATIC CHARACTER SPACING

The accu-keyer circuit (*ARRL Handbook*) had an auto- space feature which worked like this.

If you left a space of more than one dot length in your sending the keyer automatically held up the initiation of the next dot or dash for a time of three dot lengths, even if you only left a space of one and a half dots. So you could be really sloppy with your timing and still get the character spacing perfect every time. There is only one drawback, at higher speeds of 25 WPM, the dot space is so small (about 50 milliseconds) that if you are too slow slapping the dot-dash for the letter A, the circuitry thinks you are sending E T and puts in the space.

I think this is what brass-pounders mean when they say that keyers sometimes have a mind of their *own*. Not surprisingly the letter N is okay as you have more time to let the dash paddle off before tapping the dot. So if you hear someone jumbling up their As by sending E T; or his W by sending E M; or his J by sending E O; or even 1 by sending E MM; you will know exactly what is going wrong. The only way out of this dilemma is to disable the auto-character space or slow down.

Well, except for keyboards, that about covers it. I will not go into keyboards as I have never used one (for Morse) yet, but if you can type, you can send Morse with one. And if you can type fast, well . . .

But learning to send on a good keyer is probably easier than learning to touch-type, so I will leave it there.

If you want more convenience, say for contesting, you can go for an electronic memory, or even a taped message. I will refer you to the excellent article in May AR, by Ron Mills VK5XW, and Lindsay Collins VK5GZ, on their memory keyer.

If you are an avid CW operator who is just getting tired of a hand pump, or if RSI is giving you trouble, try some of the electronic keyers and see what you think.

Even if you do not particularly like CW because it is so hard, it may be worth-your-while building a cheap keyer just to see how easy it really can be, this is how I became interested in CW and that was before I took any of the amateur radio examinations. I did have a bit of a problem going back to the hand key for sending in the exams.

By the way, if you have anymore questions, do not hesitate to drop me a line and I will see if I can answer them. If I can't, I guess I will have to learn some more!

ar

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

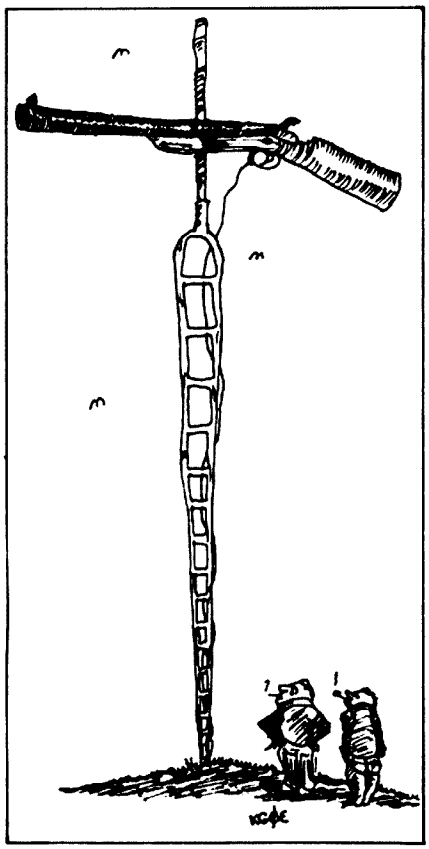
It seems to be the done thing by a number of operators not to use a log book any longer, since the necessity was abandoned by the Department of Communications.

I feel that the two main necessities of operating are a log book and using UTC time, even if one is not an ardent DXer, as it is necessary to check SWL cards and one has a record of all stations worked at their fingertips.

SWL cards are very valuable to the listener and in some countries they are obliged to show evidence by way of submitting a log and a high number of received cards from amateurs, before they are allowed to sit for the amateur examination.

If one does not keep a log, they have no way of verifying that they were on the air at that time, as some cards come in up to three or four years later and no one's memory is that good.

So for good operating practice, please keep a log book, so that the standard of QSLing will be upheld and that your card is an authentic record to the recipient.



No wonder you're such a big gun on 20 metres!

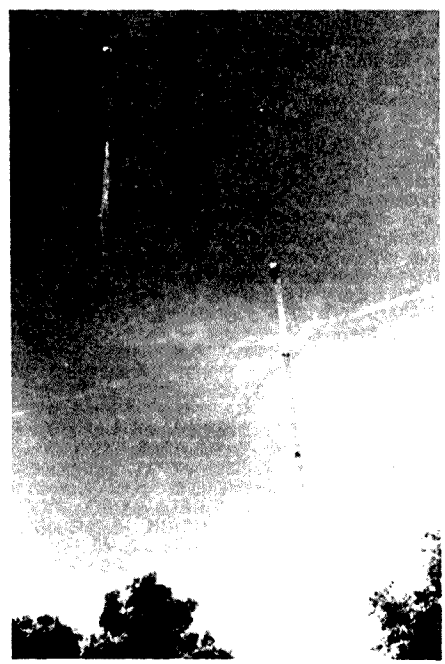
ANTENNA ERECTION

Jan and Jay O'Brien, K6HHD and W6GO, who publish the excellent QSL directory, *W6GO/K6HHD QSL Manager List*, are back on the air after moving QTH. By all accounts, complimented by a lot of finger biting, they should have a fine signal which they can point to any part of the world.

Much thought, preparation and planning went into the erection of a 48 metre tower and three monoband antennas. A KLM dipole for 75 and 80 metres which is 27.5 metres long is at 47 metres, whilst at the 45 metre mark is a KLM four element, 40 metre beam with a boom length of 13 metres and six elements situated at 43 metres and weighing in at 57 kg, resonates on 20 metres. This unit has a 17.5 metre boom.

The first lift by the helicopter.

The whole tower and antennas were erected in about three and a half hours, with, wait for it, the aid of a very skillful pilot in a helicopter. The first part of the exercise was to erect the bottom half of the Rohn 55 tower which measures 21.5 metres on to the base and position the two sets of guys and tension them. Incidentally, the base is resting on one cubic metre of concrete and there are approximately three cubic metres holding the guy anchors.



Another section of the tower being placed in position by the helicopter.

Photographs courtesy Jan O'Brien K6HHD

Bolting the last section into place.

Next part of the exercise was to place the second part of nine metres, which comprises a rotating base at the bottom and guy ring at the top, in place. The rotator was modified to rotate twice to the towers one revolution.

Next step was to place another nine metres, complete with a guy ring, on top and bolt it into place. Everything went like a dream until 'Mr Murphy' took over.

Jay, with all the coaxial cable connected to the transceivers, turned on and couldn't hear a thing. Exasperation, until he quickly discovered the remote coaxial switching device was not correctly connected half way up the tower and a quick climb rectified the problem. (You're braver than I am Jay!).

The huge arrays are 116 metres from the rotator to the operating position in the shack and the longest length of coaxial cable to any antenna does not exceed 152 metres. Another beam is yet to be placed in position, that is a six element triband beam and it will take pride of place at the 31 metre mark.

Jan remarks "How is that for an eventful Saturday?" I would say not bad Jan. They also remark even though it is in the centre of a four hectare paddock, several cars were parked on the adjacent road and even a neighbour came over to see what was happening. The neighbour turned out to be a professional photographer and would never miss out on a good picture!

To this happy duo, who give so much to the hobby, very happy DXing and don't forget to turn the beams down towards VK and make some more friends, as I am sure you will be heard and welcomed.

Complete with antenna in place.

UNWELL SWL

Recently, Eric L30042, suffered an injury which necessitates a lengthy stay in hospital.

Eric, best wishes for a speedy recovery from all DXers and readers of this column. A speedy recovery is essential so you may resume listening on the bands.

CARDS

Jim G3OKQ, who had numerous QSOs from Pitcairn as VR6JR, should be starting to answer his stack of cards by now, so please be patient and do not repeat requests.

CARDS BY THE KILOGRAM

A note from Neil VK6NE, the WIA Federal QSL Manager, states that he received a parcel of cards from the USSR. The weight was 1.875 kg and 1.050 Kg were from SWLs, with over 50 percent of the SWL cards reporting hearing a USSR station in contact with a VK0 or VK9 amateur. The QTH on the received cards to different operators were predominantly from the same city or Oblast.

If one gram is assumed for each card, then one would be reasonably correct in accessing the number, which is a lot of cards In anyone's language. There were 0.825 kg of cards for the operators.

Incidentally, Neil is still eagerly awaiting the postman to deliver his S9 card.

SELVAGENS ISLAND

If you worked the call CR9SI in August, last year, and are still awaiting a card, worry no more, as you are not going to receive one.

It is believed that the QSL Manager, CT3BD, has openly said that he has no intention of answering the cards. I hope this is not true as I feel that it is an irresponsible action that should be reported to his Society. Also, what is going to happen to the money and IRCs that have been sent. One can guess, as unfortunately it has happened before and sad though it may be, I predict it will happen again, probably many times. Unfortunately, it is not in the best interests of the hobby.

BELATED WISHES

Belated birthday wishes to Father Moran 9N1MM, who celebrated his 80th birthday on May 30.

Father Moran, has given many a new country in the long time he has been active from Nepal, whilst he has been a teacher at the Godavari School, near Kathmandu. He is very active and a keen supporter and controller of the South-East Asia Net (SEANET) on 14.320 MHz at 1200 UTC each day of the year.

Congratulations Moran from all DXers and may many happy years of operating lie ahead of you.

NO QSL BUREAU

The following countries do not have QSL facilities, therefore cards must be forwarded direct or to a manager if known — please do not send to your bureau.

3C	Equatorial Guinea.
3V	Tunisia.
3W/V	Vietnam
3X	Guinea.
4W	North Yemen.
5A	Libya.
5H	Tanzania.
5R	Malagasy.
5U	Niger.
5X	Uganda.
7Q	Peoples Democratic Republic of Yemen.
8O	Maldive Islands.
9G	Ghana.
9N	Nepal.
9U	Burundi.
A5	Bhutan.
A6X	United Arab Emirates.
A7X	Qatar.
BV	Taiwan.
C9	Mozambique.
D6	Comoros.
ET	Ethiopia.
HZ	Saudi Arabia.
J5	Guinea-Bissau.
KC4	US Antarctica.
KC6	Belau and Micronesia.
KH1	Baker and Howland Islands.
KH3	Johnston Island.
KH5	Palmyra and Jarvis Islands.
KH7	Kure Island.
KH9	Wake Island.
KP1	Navassa Island.
KP5	Desecheo Island.
P5	North Korea.
T2	Tuvalu.
T3	Kiribati.
T5	Somali.
TJ	Cameroon.
TL	Central African Republic.
TN	Congo.
TT	Chad.
TY	Benin.
TZ	Mali.
V4	St Kitts/Nevis Islands.
VK0	Macquarie and Antarctica.
VP2E	Anguilla.
VR6	Pitcalrn Island.
XT	Burkino-Faso.
XU	Kampuchea.
XW	Laos.
XX9	Macao.
XZ	Burma.
YA	Afghanistan.
ZA	Albania.
ZD7	St Helena Island.
ZD9	Tristan da Cunha.
ZK2	Niue Island.
ZK3	Tokelau Island.
ZS2	Marion Island.

SURPRISE!

Don't be surprised if 1987, or before, sees individual stations being licenced in the Peoples Republic of China. A recent meeting by the authorities was due to consider such a move.

UNUSUAL CARDS

GB8OC, operational from the City of Birmingham in a bid to hold the 1992 Olympic Games from that city, is having six operating stints this year. Each operating stint will have a district QSL card. The June 14/15 operation depicted Horse Jumping, the theme for the July 18/19 schedule featured Athletics. These cards are well worth having in ones collection, so keep listening. Bureau QSLing is in order, considering the price of postage which has escalated dramatically.

CHANGE OF HEART

Mike A71AD, as mentioned previously in this column, had to leave his logs behind for inspection by the Qatar Telecommunication Authorities, when he left the country.

The authorities have now allowed Mike to retrieve those valuable logs and the calls of A71AD, A7XD and his new call, 5B4TI, can be QSLed by sending direct to Mike Smedal, PO Box 7121, Nicosia, Cyprus.

PAPER WARFARE

A note from Steve VK2PS, says that he has been fighting the bumbledom red tape paper war and has had little time for using the rig, but managed a couple of QSOs which were quite interesting. One was a chat with HA4KYN, who was using a 20 element log periodic antenna which, believe it or not, is portable even to the angle being adjustable. This station was booming in with a 5x9 plus signal. Others that Steve had a few words with were EA8ACH on 20 and a nice contact with Lynn WH8AAP, on CW.

Steve received a nice selection of cards during the month, including 5E1EJ, EA8ANR, JT1BH, VO1CA, VR6TC, VS6AD, XO3IY, XX9DX, YE3C and ZK2KH.

The YE3C card was to commemorate the 40th Anniversary of the Indonesian Army Signal Corps.

Another keen DXer, Jim VK3YJ, has been tied up with other commitments but has managed to work 3C0A, 5H2ZR, 9H1EL, 9J2BO, 9V1TL, 9Q5CT, A22DP, AP2SQ, C21RK, HL7AP, HS0A, OH0AM, PA0QRS, T2ITA, UI8GM, VE2PAB/YK, VK0SJ, VU2TN, VQ9DL, VQ9ZZ, WB6JEB/KH7, ZL7AA and ZS2SB on 20 metres SSB.

ANNOBON

Annobon, now known as Pagalu, is a fragmented part of Equatorial Guinea which suffers a fragile economy, regional differences and the incubus of a heavy psychological legacy from the colonial era. The colonial era ended when it gained its independence on October 12, 1968.

This rugged volcanic island, with a rainfall approaching 3000 millimetres per year, is located in the Gulf of Guinea with the co-ordinates of one degree 25 minutes south and five degrees 36 minutes east, and occupies an area of 17 square kilometres, comprised by a conglomeration of cones. Monte de Santa Mina is the highest and it rises to an altitude of 670 metres.

It is 150 kilometres south-west of the Principe of Sao Tome and about 650 kilometres south-west of Macias Nguema Biyogo from where it is administered.

Pagalu, is approximately seven kilometres long by four kilometres wide. The population of just over 1400, mainly live in San Antonio where the fishing and minor lumbering activities are located. The language spoken is a Portuguese patois.

THE PREFIX FK25

Another prefix, this time from New Caledonia. The prefix FK25 is being used to celebrate the 25th anniversary of the Amateur Radio Association of New Caledonia from the ninth of last month until the end of the year.

A very attractive commemorative award will be Issued to anyone making one contact with the Club Station FK25A, or three contacts with different FK25 stations, or five contacts during the above period with stations using the prefix FK8, FK1 or FK0.

Cost of the award is five IRCs or US$2, with a certified log being sent to PO Box 3956, Noumea, New Caledonia, South Pacific.

4UIVIC

This club is seeking legal advice on their DXCC problem. But putting this aside, they have a beacon on 23 cm, holding licence classes for would-be amateurs and are getting organised with Packet Radio.

The Clubs Office Bearers are well known DXers. Dick K7AWD/OE1ZOS, is President, John NK4N/OE3ZOC, Vice-President and Station Engineer. Jerry OE3JBU, has the onerous task of being the Secretary/Treasurer.

DON'T MISS

The station signing 6K86AG, is commemorating the Asian Games being held in South Korea. It is believed a very special card has been created for the operation.

NEW CLUB

The Falkland Islands Amateur Radio Club was formed on June 3, this year. It was inaugurated at the Mount Pleasant Airport in a bid to bring together active VP8 operators and act as a QSL Bureau. The Secretary is Barry VP8WTW and the address is PO Box 260, Mount Pleasant Airport, Falkland Islands.

THE LOW BAND

Ron VK3BEE, has been around this band as time permits. He has heard UA9UCO, in the morning hours on June 25, at 2150 UTC and UA4KBH, three days later at 2200 UTC. Both were on CW. In the evenings VE7BS was heard on SSB at 1130 UTC on July 24, with VE1ZZ, being noted at 0730 UTC, working CW on July 12.

Ron has been active in the evenings on SSB and worked KL7Y at 0920 UTC on May 1. AA1K at 0930 UTC and VK0SJ (Macquarie Island) at 1030 UTC were in the log for June 24. Next day, at 0910 UTC, FO0ASJ was snared and two days later the same station was worked on CW, at 0915 UTC.

Ron, has also worked ZLs 2APM, BFG, BFU, 4IG and VKs 2, 3, 4, 5, 6 and 7.

Other interesting information on this band is that, as from July 1, the following club stations received permission to operate. They are HG1S, 1Z, 5A, 6N, 6V, 7B, 8U and 9R.

BITS AND PIECES

Doubtful operations are from stations signing with the prefix **SU0** and the station **7O2FF**, which has been heard on 20 metres. Other doubtfuls to beware of are **4W1NN, KH8KY, P23UKK, ZA1C** and ZA9RZE. * * SX1MBA, was used from the radio room of the battleship *George Averoff* to commemorate Greek Navy Week. * * YM3KA, an unusual call, was aired from Izmir. * * Special QSL cards are available for working ZY2KMT,

LQB, MKL, MOK, MXK, a call used to commemorate the 51st Anniversary of Aquas da Prata City, a major Brazilian tourist resort. * * Jean Paul 5R8JD, was quite active up until he went QRT in the middle of last month. * * Allen ZL7BKM, is around a lot on the bands and QSLs go to ZL2HE. * * Tom AH9AC, can be heard frequently on 20 metres. * * I3BQC/SDI were operational from San Francesco del Deserto Island which is located in the middle of a lagoon. (What next . . . VK3AH). * * 3A0A, Pagula Island, worked many Europeans and a few VKs. * * DV licence holders are allowed above 14.275 MHz, DW 40 metre CW only. * * Manola 3C1MB, should be using a beam by now. * * The first amateur radio festival in Turkey was marked by the use of the calls TA3KA and YM3KA. * * 'Bull' 9U5JB is now QRT, QSL to ON5NT (No Trouble). * * Some HA operators now have permits for 160 metres. * * Albert FO8JR, anticipated being operational from Tubuai Island, located about 650 kilometres south of Tahiti from August 12, for one month. It counts as French Polynesia and QSLs go to PO Box 10127, Paea, Tahiti, French Polynesia. * * Rick HC1MD/HC8, was combining a family trip with some DXing from Puerto Ayora in the Galapagos Islands last month. QSL to PO Box 62, Rochester, Michigan 48063, USA. * * A61AA may be active again with John W4FRU, being the Manager. * * Present Vietnamese law prohibits the entry of any type of transmitting equipment into the country. Hence no XV operation. * * Members of the Japan UNICEF Club, operated HS0C at the end of July. QSL to JA8ATG. * * Well-known QSL Manager, John W4FRU, has been appointed the Chairman of the ARRL DX Advisory Committee. Congratulations or should it be commiserations, John * * It is anticipated that 3C0A cards will take a long time to be processed, due to a photograph being selected, printing and finding out who will have the onerous task of filling them out. So have patience and do not double up on the cards, please. * * GB2WED and GB6RW were special call signs used for the Royal Wadding, for one day, July 23. QSLs for GB2WED to G4IVJ and GB6RW to G4KIU, either direct or via the bureaus. * * GB6NR was used to celebrate 25 years of nuclear power. QSL to PO Box 73, Ipswich, England. * * Dennis W6UBC/OX3, hopes to be set up for DXing shortly and to also obtain his own call sign. * * KH6JEB/KH7, was quite active from Kure Island. Now QRT, but KH6LW was due to be active last month, mainly on CW. * * The ZY prefix, was in commemoration of the 51st Anniversary of the city of Aquas da Prata in Brazil's San Paulo state. Commemorative QSL cards will be issued. * * PA6VHS, will be operational on CW until October 30, to commemorate the 25th Anniversary of the Very High Speed QSL Club. QSLs to PA0DIN. * * TA2L, is a new station who operates SSB only. * * The NIAR in India advertised that they had QSL cards available for members. Orders received in the first week of announcement in their newsletter, exceeded 5000. * * The Burmese Government have advised the IARU again, that amateur radio has not been legal since January 10, 1964. There was no indication if their would be a change in their policy. * * The special call A4XOS, was used from the special camp of the 17th Arabic Scouts, at Salalah in the latter part of August. QSL via the Royal Omani Amateur Radio Society. * * GB8CG, was the special call for the Commonwealth Games. * * T32AU, was Alan T30AT. QSL to G4GED. * * Fluent in the French language? Then look for Bernard FY4EE, who also operates 30 metres.

THANKS

Sincere thanks are extended to the following: The Editors of weekly, biweekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-QSO, DX FAMILY FOUNDATION NEWSLETTER, INSIDE DX, THE W6GO/K6HHD QSL MANAGER LIST, KH6BZF REPORTS, NATIONAL INSTITUTE OF AMATEUR RADIO HYDERABAD, PAPAKURA RADIO CLUB BULLETIN, ORZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, cqDX, DX POST, JA CO, JARL NEWS, KARL NEWS, OST, RADCOM, VERON and WORLDRADIO.

Members who have contributed include VKs 2PS, 3BEE, YJ, YL and 6NE. Overseas amateurs include K6HHD, W6GO, ZLs 1AMM and AMN. Sincere thanks to one and all who have made this months column possible.

BEACONS

Tim Mills VK2ZTM

FTAC BEACON CO-ORDINATOR

PO Box 204, Willoughby, NSW. 2068

The HF Beacon concept was described In the last report. This month we will look at VHF/UHF Beacons.

In Australia, six metres to 23 cm has been band planned with 200 kHz being set aside for beacons. Each State or Territory has four allocations, with the second last figure in the frequency indicating the State — eg the two metre VK2RSY Dural Beacon is on 144.420 MHz. The prime allocation occupies the .4 to .5 region of the band with allocations every 5 kHz — eg VK2 also has 144.425 MHz. There is a secondary allocation for each State's other two channels, and except on six metres, this is between .5 and .6. On six metres it is .3 to .4 to avoid the FM allocation of 52.525 MHz.

A variation to the above is practiced with a couple of VK6 systems. The harmonic relationship of 2-70-23 allows a single crystal to produce an RF source and then to tap off some power at each band via an amplifier or straight to the antenna.

A few of the older beacons, for various reasons, have stayed on their original frequencies. Pre-band planned beacons appeared almost on any frequency, often with the first crystal which came to light from the junk box.

The role of a beacon has been mentioned previously, and as I view it includes:

- a local signal source of known characteristics for receiver, antenna adjustment and reference
- a signal source over a (distant) path which can be observed by manual or automatic means. (Project Assert did this in the late 1970s)
- they provide signal sources to see if there is a band opening or a path between your location and the beacon.

I think that there is little to add to the operation of beacons at VHF or UHF frequencies. However, it is at microwaves that beacon guidelines need to be formulated and I ask all interested parties to contribute.

First, these frequencies are perhaps the last for amateur experimentation. They already have heavily commercial use, and in most portions we are the secondary service. There are only a few amateurs in ratio to other bands and much of the operation is likely to be either home-brew on converted/adapted equipment. (You don't go down to the local store and buy your equipment!).

Why would anyone want to put a beacon on a microwave frequency? I would think for the same roles as outlined above. Certainly it provides a local — constant — signal source, and signals lead to activity. Perhaps the most important thing is the beacon frequency/s with relationship to band use. It needs to be within the reception range of equipment in use but not to interfere with normal working. With widely separated centres of amateur population, it could be possible to have a common beacon frequency on each band which could then be registered as an assignment for that purpose. Power levels are going to be low and antennas need to be designed to provide the best coverage for the users in the region.

VK2 is currently developing beacons for VK2RSY Dural on 10 and 24 GHz. The frequencies being used to start the construction are 10.300 GHz and 24.100 GHz. They may be modified later to suit the Band Plans being developed.

Can you contribute to the *Beacon Paper* currently being prepared? Your input would be most welcome and should be sent to FTAC, PO Box 300, Caulfield South, Vic. 3162.

AMATEURS SATELLITE "GATEWAY" OPERATION

▽ Amateur radio operators in West Virginia and California, USA, made a communication breakthrough on May 28, 1984 that may have far-reaching future uses both amateur and commercial. A short-range two-metre repeater was linked into a far-range transponder on an amateur satellite that enabled two very low-power transceivers to make contact across the United States.

Jay Paulovicks KD8GL, in Wheeling West, Virginia on a 300 mA hand-held contacted Karen Henderson KB6DQQ, in Los Angeles. Karen was using a one watt hand-held. This was one of a series of tests conducted by the *Triple State Radio Amateur Club* using a system called "gateway" by the Amateur Radio Satellite Corporation (AMSAT). The satellite "gateway" stations were WB7ZTV, operated by Don Knollinger in Moundsville WV, and N6JFD operated by John Henderson, California.

To show further applications of this capability, one amateur in the Wheeling area using a low-power hand-held, had several contacts with stations at Lake Havasu, Arizona. To demonstrate the new long-range capabilities, 19 stations made contact with ZL1AOX in New Zealand and several with G8MSZ in the United Kingdom, during the series of tests.

The repeater station operating with the satellite changed the two-metre FM signal received from the hand-held unit to SSB on the 436 MHz up-link to the satellite, and from 147 MHz on the satellite downlink to FM on the two-metre repeater transmitter back to the hand-held unit. Originally the setup used phone-patch hookups between the repeater and the satellite station but this was later eliminated by the use of Gunnplexers between the repeater site and the satellite station.

According to an AMSAT official, WA2LQQ, "this historic event marks the vanguard of easy-access satellite communications for utility use by minimally equipped amateurs. Nothing can beat the flexibility of your own OSCAR station, but for those just starting out, this seems a good way to taste the wine before one buys the bottle."

An editorial in *Westlink* commenting on this application break- through test stated: "It signals the end of the stereo-type of a repeater as being limited to a given locality. Now, that same repeater when tied to an OSCAR-10 earth station . . . has the ability to provide its users with much greater coverage than had been thought possible. It means that high frequency traffic nets, that currently fight the effects of propagation abnormalities and intentional and unintentional QRM, can begin to think about the possibilities that lie in linking themselves via satellite. It also means that in time of emergency, the extreme reliability of satellite communications can be depended upon for the saving of lives. The possibilities are endless."

A free Information kit is available (by sending IRCs) from: AMSAT, PO Box 27, Department GW, Washington, DC 20044 USA.

Written by Ralph McDonnough K8AN and reprinted from *Telecommunication Journal*, Vol 53, V/1986

DIGITAL FINGERPRINTS

The Australian Federal Police and state police departments are to have on-line connection to the NSW Police's computerised fingerprint data-base.

They will eventually use NEC equipment to digitally record fingerprint images. The NEC automated fingerprint identification system is a world first and speeds up the checking of prints left at crime scenes which has traditionally been done manually.

The data-base contains 2.6 million individual prints and has the capacity to handle six times that amount.

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton. SA. 5014

AWARDS ISSUED RECENTLY

WAVKCA Award

1485 David Brighton G4ISK
1486 Yoshihiko Hirano JA2MNB
1487 Akiyoshi Takahashi JA7AER
1488 Carlos W Diez M. TI2KD

VICTORY 40 AWARD

I was pleased to receive these in bulk from Moscow, and they have been distributed as follows:

225 Alan Roocroft VK5ZN
359 J A E Woodings VK6AJW
377 H Rusjven VK4BHR
581 Joe Ackerman VK4AIX
587 Gwen Tilson VK3DYL
700 H Rusjven VK4BHR
1066 Ken D Hall VK5AKH
1141 VK2CFN
1183 D Couch VK6WT
1237 Henry G A Andersson VK8HA
1451 C J Willard VI3CJW
1601 J T Kelleher VK3DP

YL INTERNATIONAL SSBers, INC

Thanks to Gray Taylor VK4OH, who sent me a newsletter from which the following information has been extracted.

Firstly, I notice that membership is not restricted to YLs, and secondly, that CW contacts qualify for awards as well as SSB.

There is a comprehensive program of about 50 awards, most of which are available to non-members, and most of these are granted for contacts with members, and some of which are available to SWLs.

For example, the basic *King Neptune Award* may be obtained for contacting 10 USA members and five DX members, and is available to SWLs also; whereas the *North Star Award* is issued in five classes:

Class A for working a member in 150 countries
Class B for working a member in 100 countries
Class C for working a member in 50 countries
Class D for working a member in 25 countries
Class E for working a member in 6 continents
This Award is not available to SWLs.

Membership is world-wide, from AD1S to 9Y4VV, with more than 14 000 members listed. Space forbids reproduction of all the details here, but if anyone would like further information, please send me the cost of copying and posting six pages (for awards list and rules), plus 60 pages of members listing, or write direct to 428 SW 28th Road, Miami, Florida, 33129, USA.

MARION'S CENTENARY CELEBRATIONS AWARD

As 1986 is the Centenary of the Marion Council, which was proclaimed on September 2, 1936, a special event station using the Jubilee 150 call sign, VI5JSA, will operate from the City of Marion Library from August 26 to September 5, 1986.

A Marion Centenary Award will be issued to stations working (or SWLs on a heard basis) VI5JSA. Endorsements for CW, SSB, RTTY and VHF will be available. Applications may be a log extract or a QSL card with $2 (or four IRCs) direct to the Award Manager, VK5SJ (QTHR) or endorsed "Marion Centenary Award" c/- Box 1234, GPO, Adelaide, SA. 5001.

WOMBAT AWARD

This Award is issued by the Shepparton and District Amateur Radio Club, and is available to all amateurs and shortwave listeners who obtain the required number of points.

To qualify for the Award, applicants must log the Club Station, VK3DBS, and club members to a total of 15 points. Points will be awarded as follows:

Club Station, VK3DBS — three points
HF and VHF Simplex Contacts — two points
Mount Wombat Repeater Contacts — one point

The Club Station may be logged only once, however, repeat contacts with club members is allowed after 24 hours has elapsed.

Contacts may be logged during the Club Net every Tuesday evening at 0930 UTC, on 3.610 MHz, ±QRM, or at 1000 UTC on VK3RGV, 146.650 MHz.

The attractive Award Certificate is 21 x 29 cm and has a brown design and lettering on a yellow background. Cost of the Award is $3 and applications should be sent to the Awards Manager, SADARC, PO Box 692, Shepparton, Vic. 3630. A list of club members is available from the same address, please send a SASE.

SHEPPARTON & DISTRICT AMATEUR RADIO CLUB INC.

SPONSORS OF VK3RGV LOCATED ON MT. WOMBAT

WOMBAT AWARD

PRESIDENT — AWARDS MANAGER

CERTIFICATE № 199 AWARDED _____ 19__,
TO SAMPLE

FOR CONTACTS WITH MEMBERS OF SADARC IN ACCORDANCE WITH THE RULES.

PADDLE STEAMER *INDUSTRY* JUBILEE 150 AWARD

From September 19-22, 1986, VK5JSA will be operating from on- board the paddle steamer *Industry* at Renmark, In the Riverland of South Australia. This event is to enable amateur radio operators to gain further points for the Jubilee 150 Award.

During these four days, VK5JSA will be working all bands, 7.086, 14.186, 14.286, 21.186 and 3.586 MHz. One contact with VK5JSA on any band will be worth 15 points for the Jubilee 150 Award.

In addition, there will be available to all amateurs who contact VK5JSA on the paddle steamer *Industry* an award called the *Paddle Steamer Industry Jubilee 150 Award.*

A QSL card confirming the contact date, time, signal report, etc, plus $2 for packaging and postage should be sent to the Awards Manager, Douglas Tamblyn VK5PDT, PO Box 646, Renmark, SA. 5341.

Contributed by Douglas Tamblyn VK5PDT

BFRA AWARDS PROGRAM

The Bulgarian Federation of Radio Amateurs has an interesting awards program with six certificates, available to amateurs world-wide, for two-way contacts or SWL reports on CW, SSB, AM or mixed-modes. Applications of the GCR list of claimed QSOs are to be verified by two licenced radio amateurs or the local club authority and must specify stations worked, date, time in UTC, band, and mode together with a fee of 10 IRCs. The address for all awards is PO Box 830, Sofia 1000, Bulgaria.

People's Republic of Bulgaria

Valid QSO/SWL reports after January 1, 1965. Applicants require 20 QSO points with different Bulgarian amateur stations, 10 with LZ1 and 10 with LZ2, irrespective of the band.

Five-Band LZ Award

Valid QSO/SWL reports after January 1, 1979. Applicants require 10 QSOs with LZ1 and one with LZ2 on all bands — 3.5, 7, 14, 21, and 28 metres

W 100 LZ Award

Valid QSP/SWL reports after January 1, 1979. Applicants require 100 QSOs with different LZ stations during one calendar year.

W 28 Z ITU Award

QSO/SWL reports after January 1, 1979 are valid for this award and applicants require QSO/SWL reports with the following countries of 28 ITU zone:
DL, DL7 West Berlin, FC/TK, HA, HB9, HB0, HV, I, IS, LZ, M1, OE, OK, SP, SV, SV5, SV9, YO, YU, Y2, ZA, 9H, 4U1ITU.

This award is issued in three classes —

Class 1 — 28 QSOs with different stations in 20 countries.
Class 2 — 28 QSOs with different stations in 16 countries.
Class 3 — 28 QSOs with different stations in 10 countries.

In addition, five QSOs with different LZ stations are required.

Black Sea Award

Valid QSO/SWL reports after January 1, 1979. Applicant require 60 QSO/SWL reports with different amateur radio stations located in the countries bordering the Black Sea. A minimum of one QSO/SWL report with each of the following countries LZ, TA, YO, UA6, UB5, is an additional requirement.

Sofia Award

Valid QSO/SWL reports after January 1, 1979. Applicants require 100 points from QSO/SWL reports with amateur stations situated in the capital of Bulgaria — Sofia. The calculation of the points has to be made in accordance with the following table.
3.5 — 15 points, 7 — 5 points, 14 — 1 point, 21 — 2 points and 28 MHz — 3 points.

A QSO/SWL report with the same station may only occur once per band irrespective of mode.

The most active stations in Sofia are:

LZ1s — KAA, KAB, KDP, KPG, KSA, KSF, KVV, KWF, AB, AD, AM, AP, AQ, AU, BC, FF, FN, IA, JW, KX, LB, MS, NP, QG, QI, QP, SS, UA, UO, WV, WD, WJ, XL, XX, ZQ.

LZ60 Jubilee Award

This Award is a special award issued by the Bulgarian Federation of Radio Amateurs to celebrate the 60th Anniversary of the foundation of the first amateur radio club in Bulgaria, in 1926.

The Award is issued to radio amateurs worldwide. It is available to those who have contacted (or heard) Bulgarian amateur radio stations during the period July 1 to December 31, 1986, and have scored 60 points.

A contact with a LZ6 station counts as six points.

A contact with a LZ1 or LZ2 station counts as one point.

Each LZ station may be worked only once.

The Award is issued free of charge.

An application, accompanied by an extract of the stations log, certified by an Awards Manager, or two licenced amateurs, must be sent to Bulgaria, 1000 Sofia, PO Box 830, BFRA, before July 1, 1988.

Contributed by Z Buchkova LZ1ZQ, BFRA Secretary

RALLY AUSTRALIA AWARD

This award is presented by the Redcliffe Radio Club. Its objective is to travel around Australia by radio, making progressive contacts as you go.

The award will be available in two grades — a Basic Award and an Enhanced Award, with mode and/or band endorsements available.

Basic Award — requires contacts with 25 cities and towns throughout Australia, with mandatory check-points where contacts *must* be made.

Valid contacts are those made from October 1, 1986. There is no time limit on the completion of the Rally — you may do it in one week or one year, or longer.

The *first* and also the *final* contacts must be made with a member of the Redcliffe Radio Club. Should the Redcliffe Radio Club member not be a resident of the City of Redcliffe, the contact will still be valid, provided this member made the contact from his usual QTH.

Mandatory Check-points — Redcliffe; Brisbane; Sydney; Canberra; Melbourne; Hobart; Adelaide; Perth; Darwin; Mount Isa; Townsville; Redcliffe.

A further two contacts in VK2, VK3, VK4, VK5, and VK6 and one in each of VK1, VK7 and VK8 must be made in progressive order, in location, date and time with mandatory check-points.

The Rally can be run in the order as outlined above (clockwise) but you may also elect to run in the reverse direction (anti-clockwise).

The Enhanced Award — The Enhanced Award requires the following:

Contacts with all Mandatory Check-points.

Points totalling 1000 from progressive contacts (in location, date and time) throughout Australia (see below).

Extra time points will be awarded for completion of the Rally within three months.

The point scoring is for contacts within:

VK1 . . . 20 points; VK2 . . . 10 points; VK3 . . .10 points; VK4 . . . 10 points; VK5 . . . 20 points; VK6 . . . 20 points; VK7 . . . 20 points; VK8 . . . 20 points.

Time bonus points apply if the rally is completed in seven days . . . 150 points; 14 days . . . 120 points; 21 days . . . 100 points.

For every further seven days or part thereof, deduct 10 points. This means that, should you not be able to finish the Rally within three months, the basic 1000 points are required.

While contacts anywhere in Australia may be made, an attempt to return to the coast-line as near as possible to the last coastal contact is mandatory.

To encourage more inland contacts, should the return to the coast be at the location where the coast was left and the second contact is not with the same station or if the same coastal station is worked after 48 hours have elapsed, the inland contact is worth an extra 50 points.

(NOTE: If, for instance, you work/hear a station in Rockhampton and then a station inland at Longreach, there are three ways to return to the original Rally.

1. One tries to work/hear another station in Rockhampton

2. One tries to work/hear the same station in Rockhampton, but only after 48 hours has elapsed

3. If it is impossible to hear/contact Rockhampton, then one can try to make contact with a Gladstone or Bundaberg station (clockwise-trip) or Mackay (anti-clockwise trip). However, in this case, the Longreach station will only be worth 10 points as against the extra 50 points under 1 and 2.

It is therefore essential to have a map of Australia ready at all times in the shack.

Applications for this Award must be accompanied by a Certified Log extract, showing date, time, call, band, mode and location of the stations worked. Certification to be signed by two other radio amateurs. (QSL cards are not required for application).

Cost of the Basic Award is $A4 or 12 IRCs. The Basic Award consists of a well-designed two-colour Certificate and will be sent via air mail.

Cost of the Enhanced Award is $A18 or 54 IRCs and will also be sent via air mail. The Enhanced Award is a specially designed 190 x 280 mm plaque.

Listeners can also participate and must follow the same rules on a heard basis, as stated above. Their application log extracts must also include the call sign of the station worked by the logged Australian station.

Applications should be sent to: The Awards Manager, Redcliffe Radio Club, PO Box 20, Woody Point, Old. 4019.

The Redcliffe Radio Club conducts Award Nets on:

Wednesday, 0930 UTC, 3.612 MHz; Saturday, 0430 UTC, 21.190 MHz; Saturday, 0530 UTC, 14.150 MHz; Sunday, 0930 UTC, 3.612 MHz. (All frequencies are ±5 kHz).

Any queries about this Award will be answered on the nets (VK4RC or VK4VRC). In the process you could qualify for another award, the Redcliffe City Award!

The *Maidenhead Locator* for Redcliffe is QG 62 MU and is about 30 km north of Brisbane, the capital city of Queensland.

AWARDS PROGRAM OF THE HUNGARIAN RADIO AMATEUR SOCIETY

General Rules as at January 1, 1986

1. Hungarian Awards can be obtained by licenced radio amateurs and SWLs world-wide. The specific rules of awards are given below.

2. All amateur bands and modes may be used, except contacts via repeaters.

3. Contacts/reception may be made from any location within the same DXCC country. Each station may be contacted only once on any band and any mode.

4. The log should show the call sign/s, name and QTH of the applicant, as well as the following information:

Station Worked/Heard; Date; Time in UTC; Band; Mode; Received Report (SWLs should indicate the station being worked by the heard station).

5. Each list must be accompanied by a statement from the applicants national society or from any two amateurs, other than the applicant, that the QSL cards of the contacts/receptions listed are in the possession of the applicant and that the items of the cards are correctly listed. (The exceptions are the Szeged Festival and DUNAFERR Awards when only a log extract is required, plus the confirming piece from QSL cards).

Foreign participants in the HA-DX Contest may apply for the following Hungarian Awards upon the contest QSOs using a separate application form: Budapest, Balaton, Dunakanyar, Pannonia, Savaria and WHD.

6. The fee for Hungarian Awards is as follows:

Pannonia, Savaria, Balaton and Budapest — all 10 IRCs each; Hungarian Rummy Diploma/HRD, Hungarian Canasta Diploma/HCD, Szeged Festival and Worked Hungarian Districts/WHD — all five IRCs each; Videotron Bronze — two IRCs, Videotron Silver — three IRCs and Videotron Gold — five IRCs; Hungarian Castle Series/HCS — Bronze, five IRCs, Silver, eight IRCs and Gold 10 IRCs; Dunakanyar/DD — six IRCs; Dunaferr no fee but postage should be sent.

7. The decision of the MRASZ Award Committee is final.

8. All correspondence may be sent to the Manager, or to the Hungarian Radio Amateur Society Award Committee, PO Box 22, Tiszakecske, Hungary. H- 6061.

Pannonia Award

The Radio Amateur Society of Gyor-Sopron County Issues this Award. Applicants must submit proof of contacts made on or after January 1, 1966.

Applicants must obtain eight OSL cards from HA/HG 1, 2, 3, 4 call areas/two cards from each call area/more than one band. Manager: Radio Club HA1KSA, PO Box 79, Gyor, Hungary. H-9001.

Savaria Award

The Radio Amateur Society of Vas County issues this Award. The applicant must submit proof of contacts made on or after January 1, 1976.

Applicants must obtain 10 different HA1 or HG1 QSL cards. Manager: Savaria Radio Club, Puskas Tu7, Szombathely, Hungary. H-9700.

Balaton Diploma/BD

The Radio Club Siofok issues the BD. The applicant must submit proof of contacts made on or after January 1, 1967.

Amateurs must make two-way communication with amateurs indicated under a), b), or c). Stations require 15 points and at least one contact should be with a member of the Radio Club Siofok.

a) Radio Club Siofok and its members count as five points. HA, HG3KGJ, KHL, GI, GJ, GQ, HE, HL, HQ, HZ, IG, IK, IQ, IS, NG, 4XW, 6NP, 8UA.

b) Stations with a permanent station around Lake Balaton count for three points. HA, HG1KXX, XA, XH, XX, ZY, 2KRQ, RQ, RC, SH, Y, YRC, 3KHB, KHO, GG, GO, HK, HO, HU.

c) Any other stations in Zala, Veszprem and Somogy County count one point. HA, HG1KRA-KRZ, KXA-KXZ, KZA-KZZ, RA-RZ, XA-XZ, ZA-ZZ, DRA-DZZ, 2KPA-KTZ, PA-TZ, ENA-EZZ, 3KGA-KIZ, GA-IZ, FLA-FSZ.

Manager: Jozsef Turjanyi HA3GJ, PO Box 78, Siofok, Hungary. H-8601.

Budapest Award/BPA

This Award is issued by the Radio Amateur Society of Budapest. Applicants must submit proof of contacts made on or after January 1, 1959.

Stations must have obtained 25 different QSL cards from HA, and HG5 stations. Manager: Verebes Janosne HA5YR, PO Box 64, Budapest, Hungary. H- 1475.

Hungarian Rummy Diploma/HRD

The Amateur Radio Society of Somogy County issues the HRD Awards. The applicant must submit proof of contacts made on or after September 1, 1972.

The HRD Award is issued in three categories.

BRONZE: "hand rummy" collecting 14 cards in accordance with the rules of the game.

SILVER: full collection of one of the four series plus one Joker of the same colour. For example — diamond 2 . . . A plus red Joker. /14 cards.

GOLD: full pack, containing 54 cards.

HRD-108: two packs of QSL cards are necessary for the Award from 108 different stations.

Hungarian Canasta Diploma/HCD: Three canastas /21 cards, have to be confirmed in accordance with the rules of the game.

The canasta contains seven cards of the same figures, two of them can be equivalent; eg seven cards of figure 5, seven cards of figure 8, and seven cards of Kings. Not more than three cards substituted by the four Jokers and the "little-Jokers"/figure2/ in one canasta.

Note: Contacts on or after April 4, 1980 are valid for the HRD-108 and HCD Awards.

Amateur stations belonging to the radio club of "Tivadar Puskas" can send any kind of HRD card for QSOs. These stations are: HA, HG3 GA, GB, GD, GH, GL, GM, GR, GU, HD, HF, HH, HM, HS, HV, HX, HY, KGC, KGL, KGR, KGU, KHC, KHJ.

Allocation of the HRD cards:

Please turn over . . .

HA HG Call Areas	Spade	Heart	Diamond	Club
1	A		J	
2	2		J	
3	3		J	
4	4		J	
5	5		Q	
6	6		Q	
7	7		K	
8	8		K	
9	9		K	
0	10		K	

? ? ? red and black Joker = Y =

Manager: Jance Mihalyfy HA3GA, PO Box 173, Kaposvar, Hungary. H-7401.

Szeged Festival Award

The Amateur Radio Society of Csongrad County issues this Award yearly for QSOs made between July 1 and August 31, from 0000-2400 UTC. The deadline for applications is December 31, to the manager.

Stations must gain five points from two-way contacts as indicated in a) and b).

a) Stations with permanent residence in Szeged count as two points. /HA, HG8CA, CB, CD, CH, CP, CT, CV, CZ, CX, DC, DE, DF, DP, DQ, DR, DT, DZ, EK, EL, KCC, KCK, KDA.

b) Any other stations in Csongrad County counts as one point. HA, HG8CA-FZ, KCA-KFZ, LSA-LZZ.

Manager: Imre Kelemen HA8CH, PO Box 673, Szeged, Hungary. H-6701.

Worked Hungarian Districta/WHD

The Hungarian Radio Amateur Society issues this Award and applicants must submit proof of contacts made on or after January 1, 1958.

Stations need 10 QSL cards from any five Hungarian call areas/ HA, HG1, 2, 3 . . . 0. Two cards are required from each call area on two bands. Manager: Janos Retkes HA8UB, PO Box 22, Tiszakecske, Hungary, H-6061.

Videoton Award

The Videoton Radio Club issues this Award for applicants who submit proof of contacts made on or after January 1, 1969.

Only HA4 and HG4 QSLs are valid. There are three groups of special cards, 3-4-3 different cards illustrating a BC receiver, a TV receiver and computer set respectively.

This Award is issued in three categories:
— BRONZE: one complete set of any group.
— SILVER: a complete set of any two groups.
— GOLD: all ten cards.

Manager: Halmi Belane HA4XP, Berkes Fltp.40, Szekesfehervar, Hungary. H- 8000.

Dunakanyar Diploma/DD

The Radio Amateur Society of Pest County issues the DD Award. Applicants must provide proof in the form of five different QSL cards from the HA, HG7 call areas. Contacts to be made on or after January 1, 1970.

Manager: PRASZ Award Manager, HA7PL, PO Box 36, Budapest, Hungary. H- 1387.

Hungarian Castle Series/HCS

The Hungarian Radio Amateur Society issues the HCS Award. Applicants must submit proof of contacts made on or after January 1, 1968.

Many Hungarian stations in each call area have special cards for the HCS Award — from number 1 to number 36. It is issued in three categories.
— BRONZE: Numbers 1-12 or 13-24 or 25-36.
— SILVER: Numbers 1-24 or 13-36.
— GOLD: Numbers 1-36.

The application must be accompanied by the confirming piece from the QSL cards.

Repartition of the QSL numbers by call areas is as follows:

HA, HG1 — 7, 22, 25, 31
HA, HG2 — 6, 8, 12, 15, 21, 23, 30, 32, 35
HA, HG3 — 3, 14, 23, 30, 32, 33, 35
HA, HG4 — 17, 23, 30, 32, 35
HA, HG5 — 1, 13, 36
HA, HG6 — 4, 10, 11, 34
HA, HG7 — 2, 5, 19
HA, HG8 — 10, 20, 24
HA, HG9 — 18, 27, 28, 29
HA, HG0 — 9, 26, 29

Manager: Janos Retkes HA8UB, PO Box 22, Tiszakecske, Hungary. H- 6061.

Dunaferr Award

Issued by the Dunaujvaros Radio Club yearly for QSOs with HA and HG4 stations made between April 22 and May 8 from 0000-2400 UTC. The deadline for applications is May 31, to the manager.

Two-way contacts are required as indicated in a), b), c) below. Applicants require 40 points.

a) Club Stations in Dunaujvaros count as three points. HA, HG4KXG, KYJ, KYH, KYP, KYV, YYJ.

b) Individual stations in Dunaujvaros and other club stations from Fejer County count as two points. HA, HG4BG, XG, XU, XX, YA, YI, YJ, YK, YL, YO, YP, YQ, YU, YV, ZE, ZM, ZV and each call sign between HA, HG4KXA-KZZ, YXA- YXZ.

c) Individual stations from Pejer County count as one point. All HA and HG4 stations with a two letter suffix.

Note: This Award/Sticker may be claimed every year anew. Manager: Radio Club Dunaujvaros, Award Manager HG4YI, PO Box 132, Dunaujvaros, Hungary. H- 2401.

There is also an Awards Program for the Hungarian DX Chapter. Further information about these awards may be obtained from HADXA Award Manager, Janos Retkes HA8UB, PO Box 22, Tiszakecske, Hungary. H-6061.

ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Last month as I was compiling my 48th monthly *Intruder Watch Summary* for distribution, it occurred to me that this meant four years had passed since I was appointed *Federal Intruder Watch Co-ordinator.* Four years! It seems like only yesterday that I was struggling to put together the first of many such summaries, and trying to get it into some sort of business-like order. In those days, I did it all on a typewriter, which took about 12 hours to complete, after having received all the reports from contributing amateurs and SWLs around Australia. Now I do it on a computer, and it has cut the time by three-quarters. I won't spoil the effect by telling how long it took me to tame the computer! And I rather suspect that the computer is still grinning at my efforts from behind the safety of its monitor screen. But the blank look I get from it sometimes is what I fear most.

CONTRIBUTORS AND INTRUDERS

Many people have contributed reports to the *Intruder Watch* during those four years, and I take this opportunity to say thank you.

Hopefully, these same people, and others, will continue their support in the future. Those who helped last May were:

VK2s BQS, PS, QL, G H A Bradford; VK3XB; VK4s AKX, AV, BG, BHJ, BIW, DA, KHZ, OD; VK5GZ; VK6s JQ, OD, RO, XV, XZ; VK7s DQ, RH; VK8s HA and JF

Reports broke down as follows:

AM-mode — 419; CW-mode — 134; RTTY — 113; other modes — 75; and 45 intruders supplied us with their call signs.

INTRUDER CALL SIGNS

Norman VK4BHJ, one of the IW's consistent good observers, writes regarding the numerous stations using CW-mode, and originating in Vietnam.

As mentioned in AR, June 1986, these stations, as listed below, are all part of the Vietnam News Agency, Hanoi. The call signs are listed with the country listed in brackets being the country to whom the call is legitimately allocated.

VRQ — (United Kingdom)
VCN — (Canada)
KFB — (USA)
CFK — (Canada)
TRB — (Gabon Republic)
VZC — (Canada)
NBZ — (USA)
PKJ — (Indonesia)
VMO — (Australia)

In other words, these transmissions are not originating in the country accredited the allocation of the call, but are all being used by the Vietnamese News Agency. Still, I suppose if your intention is to *not* observe the radio regulations, it doesn't make any difference how many rules you break — that seems to the the typical intruder's philosophy, anyway.

The transmissions for these stations is of the propaganda/news type variety, with NBZ and PKJ very often on the international 20 metre beacon frequency of 14.100 MHz.

So there *you are for* this month, *and* I hope you have been having more success with DX than I have! . . . 73.

ar

AIMING HIGH WITH COMMUNICATIONS ACCESSORIES FROM GFS

WAY OUT FRONT IN AIRBAND PORTABLES THE NEW ATC-720X

- BALLOONISTS
- AERO CLUBS
- HOME BUILTS
- EMERGENCY COMMS
- RESCUE OPS
- ULTRA LIGHTS
- GLIDERS
- AIRPORT SECURITY
- HANG GLIDERS
- AIR SHOW COMMS
- EXPERIMENTAL

920 CHANNEL NAV COM — PLUS 4 MEMORY SCAN PORTABLE TRANSCEIVER

The New ATC-720X provides inexpensive airband communications for a wide range of applications. Its most important includes promoting the peace of mind which comes from knowing you have an emergency back-up transceiver with you. It is supplied complete with rubber antenna, alkaline batteries and carrying strap. **$1188 + S.T. + $18 P&P $1360 Inc S.T.**

AR-2002 Continuous Coverage 25-550, 800-1300 MHz Scanner

If you want continuous coverage AM/FM wide & narrow with 20 memories we suggest you choose the AR-2002 from GFS

$949 + $18 P&P

LOW LOSS FOAM DOUBLE SHIELDED COAXIAL CABLE

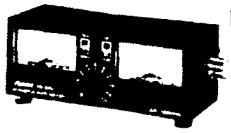
LOSS IN DB/30 METRES

TYPE	100 MHz	200 MHz	400 MHz	900 MHz
5D-FB	1.86	2.70	3.90	6.00
8D-FB	1.20	1.74	2.58	3.90
10D-FB	0.99	1.44	2.10	3.30
12D-FB	0.84	1.23	1.80	2.79
RG-8/AU	2.20	3.20	4.70	8.00
LDF-450	0.75	1.40	1.80	2.50

FB SERIES CABLE & N CONNECTORS

CABLE		N CONNECTORS	
5D-FB	$4.30	NP-5DFB	$24.00 ea
8D-FB	$8.60m	NP-8DFB	$32.00 ea
10D-FB	$11.40m	NP-10DFB	$36.00 ea
12D-FB	$15.60m	NP-12DFB	$39.00 ea

HF-VHF SWR-POWER METER



HS-260

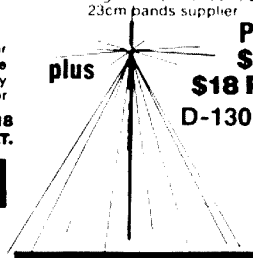
Compact, two power ranges, 0-12 Watts & 0-120 Watts, switchable HF-VHF with lighted meter. **$151 plus $10 P&P**

NEW HS-VK5 5 BAND HF VERTICAL

Fully self supporting & complete with self supporting loaded radials 80, 40, 20, 15, & 10 metres. **$538 and $18 P&P**

NEW BROADBAND OMNIDIRECTIONAL ANTENNA 25 TO 1300 MHZ

The new D-130 is one of the latest generation full coverage HF-VHF-UHF omnidirectional antennas. It provides continuous operation from 25 to 1300 MHZ and is ideally suited to the likes of the AR-2002 or the ICOM ICR-7000 scanning receivers. Also capable of transmitting on 6m, 2m, 70cm, 33cm, & 23cm bands supplied.



PRICE $346 plus $18 P&P

D-130

QUALITY CERAMIC EGG INSULATORS NOW AVAILABLE AT GFS

Search no more for those hard to get ceramic egg insulators, GFS have now secured a reliable overseas service. **CAT.E-GG $1.80 ea or $16 for 10. Plus $6 P&P**

SCAN THE BANDS WITH OUR MICROCOMM SX-155 PROGRAMMABLE POCKET SCANNER

This new unique scanner provides coverage of 26-32, 68-88, 138-176 and 380-514 MHz with a sensitivity of less than 0.5 uV. Four banks of 40 memory channels total of 160 memories. High scan speed of 16 CH/SEC. Auto search and store mode. Priority channel. 4 hour life on supplied Nicad batteries. 24 hour clock. Selectable Scan/Search delay of 0.1 or 2 seconds. Includes Nicads, charger, carrying case and antenna.

$749 + $18 P&P

ANTENNA MATCHER FOR CONTINUOUS HF COVERAGE - MFJ-941D

Apart from being extremely versatile the MFJ-941B includes a 6-position coax-switch, SWR power meter, 4:1 Balun and will feed balanced line, single wire and coaxfeed antennas.

$495 + $18 P&P

2 KW DUMMY LOAD

MFJ-250 Low SWR to 400 MHz, 2 KW PEP, supplied with transformer oil.

$199 + $18 P&P

EXPANDED RANGE OF HF-VHF-UHF ANTENNAS

LOG-SP

BROADBAND ANTENNAS

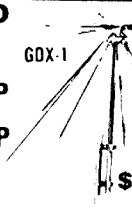
LOG SP — 65 to 520 MHz

$255 + $18 P&P

LOG S 100 to 520 MHz

$177 + $18 P&P

BROADBAND OMNIDIRECTIONAL ANTENNAS FOR SCANNERS



GDX-1

GDX-1; 16 element discone 80-480 MHz suits transmitters and receivers.

$357 + $18 p&p

HF BROADBAND DIPOLES

New T2 FD series provides continuous HF coverage

200 WATT MODELS

3.5-30 T2 FD 200 is 25m long 3.5-30 MHz

1.8-30 T2 FD 200 is 30m long 1.8-30 MHz **both priced at $205 · $18 P&P**

2KW MODELS

3.5-30 T2 FD 2KW is 40m long 3.5-30 MHz

1.8-30 T2 FD 2KW is 50m long 1.8-30 MHz **both priced at $269 · $18 P&P**

RF NOISE BRIDGE WITH BUILT IN EXPANDER

MFJ-202B

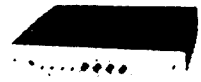
$299 + $18 P&P

FOR THE RTTY OPERATOR

MDK-17 (KIT) MOD-DEMOD

A high performance RTTY/CW modem kit for use on a computer or teletype. Offers high noise immunity on receive. **$199 · $8 P&P (kit) or $290 · $12 P&P (assembled)**

MFJ-1224



Versatile RTTY/CW modem, interfaces with a computer and is supplied with software for VIC-20 or Commodore-64. **$495 + $18 p&p**

NOW AVAILABLE ELECTROPHONE 27 & UHF. CB

We now stock the popular range of electrophone CB transceivers. For a competitive price and helpful information on which model to use for your application give us a call or simply drop in.

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	DB-4 (4mm)			DB-5 (5mm)		
	Core diam. (mm)	Wt of 200mm (gm)	Tensile S/S (kg)	Core diam. (mm)	Wt of 200mm (gm)	Tensile S/S (kg)
Debeglass	2.5	3.9	440	3.0	5.5	520
Stee wire	2.5	5.6	370	3.15	7.1	740

DB-4 (4 mm) $0.82m DB-5 (5 mm) $1.16 DB-6 (6 mm) $1.98 Debeclip Termination Clip to suit DB4, DB5, DB6 $7.50 each. Simple to use Debelock termination for all sizes $2.50 each.

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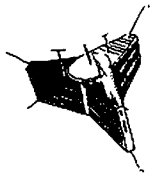

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

OSCAR-10 APOGEES
SEPTEMBER 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
0th September										
243	2419	2052:01	-17	267	273	28	282	39	301	60
1st September										
244	2421	2011:04	-17	258	279	36	290	47	318	67
2nd September										
245	2423	1930:07	-17	248	286	44	300	55	345	71
3rd September										
246	2425	1849:09	-17	239	295	52	315	62	18	71
4th September										
247	2427	1808:12	-16	230	308	60	336	67	44	66
5th September										
248	2429	1727:14	-16	220	327	66	3	68	60	59
6th September										
249	2431	1646:17	-16	211	353	69	30	66	70	50
7th September										
250	2433	1605:19	-16	202	22	68	49	60	78	42
8th September										
251	2435	1524:22	-16	192	44	63	62	53	84	33
9th September										
252	2437	1443:23	-16	183	59	56	71	44	89	24
10th September										
253	2439	1402:26	-16	173	69	48	79	36	94	16
11th September										
254	2441	1321:28	-16	164	77	39	85	28	99	8
12th September										
255	2443	1240:31	-16	155	83	31	90	20	103	-0
13th September										
256	2444	0020:02	-16	330					259	3
256	2445	1159:34	-16	145	89	22	95	11		
256	2446	2339:05	-16	321					263	11
14th September										
257	2447	1118:36	-15	136	94	14	100	4		
257	2448	2258:08	-15	311			257	0	268	19
15th September										
258	2449	1037:39	-15	127	99	6				
258	2450	2217:10	-15	302	256	-3	262	8	273	28
16th September										
259	2451	0956:41	-15	117	104	-2				
259	2452	2136:13	-15	292	261	5	268	16	279	36
17th September										
260	2454	2055:15	-15	283	266	13	273	24	286	45
18th September										
261	2456	2014:18	-15	274	271	21	279	32	295	53
19th September										
262	2458	1933:20	-15	264	276	29	286	40	308	61
20th September										
263	2460	1852:23	-15	255	283	37	295	48	328	67
21st September										
264	2462	1811:26	-15	246	291	46	307	56	355	70
22nd September										
265	2464	1730:28	-15	236	301	53	323	62	25	68
23rd September										
266	2466	1649:31	-15	227	315	60	345	66	46	62
24th September										
267	2468	1608:33	-14	217	336	65	11	66	61	55
25th September										
268	2470	1527:36	-14	208	2	67	34	62	70	47
26th September										
269	2472	1446:38	-14	199	27	65	51	56	78	38
27th September										
270	2474	1405:41	-14	189	47	59	63	49	84	29
28th September										
271	2476	1324:44	-14	180	60	52	72	41	89	21
29th September										
272	2478	1243:46	-14	171	70	44	79	32	94	13
30th September										
273	2480	1202:46	-14	161	77	35	85	24	98	4

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685 MHz — Summer: 7.064 MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305 MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGMENTS
Contributions this month are from *AMSAT-Telemail*, Graham VK5AGR, and Bob VK3ZBB.

JAS-1
The following item was posted to the *AMSAT-Telemail* bulletin board by Harry Yoneda JA1ANG.

The Japanese Amateur Radio League (JARL) JAS-1 OSCAR satellite is still scheduled for launch on July 31, 1986, at 2030 UTC. The lift-off pad for Japan's H-1 launch vehicle is located on Tanega Shima Island off the coast of South Kyushu, at 30D 23M 45S north latitude and 130D 58M 22S east longitude.

This is Test Flight #1 (TF-1) for NASDA's two-stage H-1 vehicle. In addition to JAS-1, it will carry a payload called EGP (an orbiting mirror ball) and a payload called MB FW (or magnetic bearing flywheel).

The July 31, 1986, launch window will be from 2030 to 2200 UTC. Later windows, if required, will occur from August 1, 1986, through to September 14, 1986. However, the dates August 20, 1986, through to August 26, 1986 and September 6, 1986, through to September 14, 1986, are reserved for Institute of Space Research launches.

Following is the TF-1 sequence of events after lift-off. The launch vehicle will, at event #20, be in an elliptical orbit with an apogee of 1511 km and perigee of 271 km. The second burn of the second stage at event #27 will circularise the orbit at approximately 1503 km. The JARL JAS-1 OSCAR satellite will separate at event #34 and immediately turn on its 435.795 MHz PSK modulated beacon.

SEQ	Event Description	HH MM SS	Range	Alt	Vel
1	Lift Off	00 00 00	0	0	0.4
2	Start Roll Program	00 00 03			
3	End Roll Program	00 00 08			
4	Start Roll/Pitch/Yaw Program	00 00 08			
5	End of Burn for 6 Solid Fuel Boosters	00 00 39	0.8	5	0.5
6	Ignition of 3 Solid Fuel Boosters	00 00 40			
7	End of Burn for 3 Solid Fuel Boosters	00 01 19	8	18	0.8
8	Separation of 9 Solid Fuel Boosters	00 01 28			
9	End Roll/Yaw Program	00 01 31			
10	End Pitch Program	00 04 18			
11	End of Burn for Main Engine	00 04 30	301	111	4.0
12	End of Burn for Vernier Engine	00 04 36			
13	Separation of First	00 04 38	329	119	
14	Ignition of 1st Burn — 2nd Stage	00 04 42			
15	Separation of Fairing	00 04 54	387	134	
16	Start Roll/Yaw Program	00 05 00			
17	End Roll/Yaw Program	00 05 50			
18	Start Pitch Program	00 05 50			
19	End Pitch Program	00 10 08			
20	End of 1st Burn — 2nd Stage	00 10 14	1992	342	8.0
21	Start Inertia Flight Pitch Program	00 10 46			

OSCAR-10 APOGEES
OCTOBER 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st October										
274	2482	1121:49	-14	152	83	27	90	16		
274	2483	2301:20	-14	327					262	4
2nd October										
275	2484	1040:51	-14	142	89	19	95	8		
275	2485	2220:23	-14	318					267	12
3rd October										
276	2486	0959:54	-14	133	94	11	100	0		
276	2487	2139:25	-14	308			260	1	272	21
4th October										
277	2488	0918:56	-14	124	99	3				
277	2489	2058:28	-13	299	259	-1	266	9	277	29
5th October										
278	2491	2017:30	-13	290	264	6	271	17	283	38
6th October										
279	2493	1936:33	-13	280	269	14	277	25	291	46
7th October										
280	2495	1855:35	-13	271	274	22	283	33	301	54
8th October										
281	2497	1814:38	-13	262	280	30	291	41	316	61
9th October										
282	2499	1733:41	-13	252	287	39	300	49	337	66
10th October										
283	2501	1652:43	-13	243	296	47	313	56	4	67
11th October										
284	2503	1611:46	-13	233	307	54	331	61	30	65
12th October										
285	2505	1530:48	-13	224	323	60	353	64	48	59
13th October										
286	2507	1449:51	-13	215	345	64	17	63	61	51
14th October										
287	2509	1408:53	-12	205	9	65	37	59	70	43

22	End Inertia Flight Pitch Program	00 13 16				
23	Start Inertia Flight Yaw Program	00 13 16				
24	End Inertia Flight Yaw Program	00 14 16				
25	Start Inertia Flight Roll Program	00 14 16				
26	End Inertia Flight Roll Program	00 14 46				
27	Ignition of 2nd Burn — 2nd Stage	00 54 33	17831	1506	6.8	
28	End of 2nd Burn — 2nd Stage	00 54 54	17930	1507	7.1	
29	Start Inertia Flight Roll/Pitch Program	00 55 44				
30	End Inertia Flight Roll/Pitch Program	00 57 14				
31	Separation of EGP Payload	00 59 21	16955	1505	7.1	
32	Start Inertia Flight Yaw Program	01 00 27				
33	End Inertia Flight Yaw Program	01 01 17				
34	Separation of JAS-1 Payload	01 02 07	21161	1503	7.1	
35	Switch on Experimental Flywheel	01 02 08				
36	Start Inertia Flight Roll/Pitch Program	01 02 47				
37	End Inertia Flight Roll/Pitch Program	01 04 02				
38	Change Attitude of 2nd Stage to Vertical					
39	End of 2nd Stage Control					

SEQ — Event sequence
HH MM SS — Hours Minutes Seconds after liftoff
RANGE — From launch site in km
ALT — Altitude in km
VEL — Velocity in km/s

For the latest news on JAS-1 listen to the AMSAT-Australia Net.

OSCAR-10 AGAIN FULLY OPERATIONAL

Regular users of OSCAR-10 will be aware that the "bird" is again fully operational. Following a complete analysis of the problems on board the spacecraft, Karl DJ4ZC, has rewritten the software for the onboard computer.

However, behind the scenes the experts have all been scratching the "gray matter" in an endeavour to find the best solution to the problem.

The following analysis and proposal was prepared by Ron Dunbar W0PN, a member of the world wide command station group. They are his personal opinions and do not necessarily reflect the opinions of all AMSAT Engineering personnel. However, it is an insight into the considerations that the command personnel are faced with as an ongoing day to day analysis so that "we the communicators can do our thing."

OSCAR-10 Analysis and Proposals — Ron Dunbar W0PN, June 17, 1986

1.0 Currant Status of AO-10

AMSAT-OSCAR 10 was three years of age yesterday. Despite a beginning which seemed to be ruled solely by Murphy's third postulate, the S/C has performed as well as could reasonably be expected, considering the bent antennas, less than optimal orbit, frozen 'O' rings, etc.

The satellite was designed with reliability as one of the foremost objectives. Since previous birds had succumbed due to eventual battery failure, two sets of batteries were placed on board; 10 main batteries and 10 auxiliary batteries. To date, the main cells have performed so well that there has been no need to bring the auxiliary cells online. Premature charging of the auxiliary cells would merely serve to start their "lifetime countdown" therefore, they have never been charged in orbit.

As the spacecraft aged, the effects of the high perigee (4000 km instead of the desired 1500 km) began to be noticed; at this altitude, the S/C spent significantly more time traversing the radiation-filled Van Allen belts surrounding the Earth. Each trip through this area resulted in continuous doses of undesirable radiation being experienced by most onboard components. The effects of such radiation are cumulative. The overall level of radiation induced charge keeps adding to the previous exposures..

The Integrated Housekeeping Unit (IHU ... speak 'onboard computer') memory chips are the most susceptible to excess charge of all the onboard components, since they function by storing a definable charge to represent a one or zero in a particular memory location. Over a period of time, random bits throughout the 16k memory began to fail. This did not present a disaster, since the S/C designers had included sophisticated error correction circuitry for just such an expected eventuality. The correction circuitry could detect and 'repair' a single-bit error in any given Byte of memory. It would detect, but not repair, a double-bit error per Byte.

On May 17, 1986, the error correction circuitry was apparently overwhelmed by the damaging effects of an influx of high energy particles from the Sun. The software Operating System had lost control with the Mode B transponder locked on and strings of meaningless bits being transmitted on the beacon.

As a result of many hours of diagnosis and attempts to correct the situation by ZL1AOX and others, a limited function software system was reloaded. Subsequently, limited memory tests were performed in an attempt to assess the extent of the damage and suggest methods of bypassing the faulty areas of memory.

Before these tests could be completed, the S/C was apparently subjected to yet another bombardment of radiation which reduced even the minimal operating system to an essentially useless state. In this state, the transponder and beacon are occasionally activated in an uncontrolled manner. Subsequent heavy usage by ground stations then leads to a low battery voltage condition which prevents Command Stations from being able to communicate with the IHU.

Finally, on May 19, ZL1AOX was able to deactivate the transponder and beacon, which is the current condition (providing they have not anomalously activated again by the time of this writing).

The Battery Charge Regulator (BCR) control inputs are uncertain, since no telemetry is being received by the Ground Command Stations. This means that we have no way of knowing what the battery conditions or charge rates actually are, however, even if the computer-controlled latches have been reset to zero, a hardware default setting exists which is determined by a string of resistive voltage dividers. If the BCR control latches should anomalously be set to all ONEs, there exists the possibility of OVER- charging the batteries with potentially disastrous effects due to the gas pressure build-up within the batteries themselves. This pressure is normally vented, but vents have been known to plug up, sometimes leading to a condition known as 'fast rise-time pressure relief' (aka 'explosion').

As you will come to see in the paragraphs to follow, an UNDER-charge condition has a minimal long term effect; such is *not* true with a sustained OVER-charging condition. The potential of over-charging should be avoided if at all possible, due to the permanent damage which could result. Under certain conditions, UNDER-charging *can* be of actual benefit, as we shall see.

2.0 Forecast of Evanta Through September 1986

Given the current attitude of the spacecraft, the position of the orbital plane and the orbital parameters, the sun angle will change from the current value of approximately -8 degrees to -49 degrees by 7/31 and to the NO POWER condition of -90 degrees on 9/11 as indicated by the following chart (courtesy G3RUH).

Date 1986	SUN ANG (deg)	ALON (deg)	ALAT (deg)	
May 22	16	157.5	21.7	
Jun 5	4	156.1	21.7	
Jun 19	-9	154.6	21.7	
Jul 3	-22	153.4	21.5	
Jul 17	-36	152.1	21.4	
Jul 31	-49	150.7	21.2	
Aug 14	-62	149.3	21.0	47% Illum
Aug 28	-75	147.9	20.7	26%
Sep 11	-90	146.5	20.4	OOPSI
Sep 25	-76	145.1	20.1	

"An attitude change is ESSENTIAL before the end of July" (G3RUH).

If no intervention occurs, the S/C will reach a power down condition sometime prior to September 11. At first glance, this might seem to be a disastrous event; let us analyse this condition a little more thoroughly.

Of the many events which will occur at or near the -90 degree sun angle, the following are of most concern:

2.1 Thermal stresses

2.2 Low/no power considerations
2.3 Erratic IHU operation during transition period

2.1 Thermal Considerations
From a sun angle of -45 degrees through -90 and back to -45, the sun will primarily be shining in the bottom of the S/C (rather than on the solar panels), resulting in a significant heating of that surface, while the opposite surface will suffer a deep-freeze effect. The resultant temperature of important internal modules (IHU, batteries, BCRs, etc) will reach temperatures dependent on the thermal transfer characteristics of their housings, mounting brackets, etc.

We already possess telemetry data of a similar event which took place right after the initial launching of AO-10. Analysis of that TLM data is being performed by Command Stations right now. AO-10's thermal design expert (Dick Jansson WD4FAB) will be contacted as soon as he gets back to the Continental USA on Saturday. He should be able to shed valuable light on this important subject.

NiCAD battery expert, John Fox W0LER, advises that this should make little if any difference whether the batteries are charged or discharged when they are subjected to the expected thermal stress.

2.2 Low/No Power Consideration
From both a battery and an IHU long-term 'health' viewpoint, it appears that a complete power down condition could well provide major benefits.

2.2.1 Batteries
The auxiliary batteries have never been charged; their condition should remain essentially unaltered through a forced power down situation. By the time power totally fails, the main batteries will likely have developed the notorious NiCAD 'memory' for partial charging.

Fortunately, if each cell discharges to a level of 0.2 volts or lower, (2.0 volts for the total array of 10), all 'memory' will be erased. In addition, laboratory tests by W0LER have shown that up to 85 percent of original (new) capacity can be expected from the aged cells when they are recharged once again.

W0LER further advises that he has never witnessed polarity reversal during such deep discharge/recharge cycles. (John's wisdom was gained from a five year period of daily measurement and painstaking record-keeping on this very subject).

Providing there are no disastrous temperature effects of which I am unaware, it would appear that the main batteries will actually BENEFIT from the power-down situation.

2.2.2 IHU
According to several knowledgeable individuals in the computer industry, there is a reasonable chance that the disabling excess charge on the memory chips may actually BLEED OFF if power is completely removed from the memory for at least a 24 hour period.

If this fortunate state is actually realised, we could optimistically expect to end up with a rejuvenated memory when the S/C powers up again (good for another three years?).

2.3 Erratic IHU Operation During Transition
Once the IHU supply voltage begins to fall, there is a rather narrow 'window' that exists in the shadow region between the functional and the stopped IHU states. In tests on nearly identical (simulator) IHUs in a terrestrial environment, operation was essentially normal down to the 6.0 volt level, erratic and unpredictable from 6.0 to 5.2 volts and totally inoperative below that supply voltage level.

The erratic window region does generate a certain amount of concern; in this region, the CPU may do anything. It may perform anomalous jumps to erroneous program steps, it may perform erratic I/O operations with potentially harmful results; Murphy's Law is strictly enforced in this region. The most harmful thing which can be imagined will most likely be realised.

There are certain techniques which can reduce this hazard; they will be addressed later. The major point to be made here is that the time spent in this 'transitional area' should be minimised by any means possible.

3.0 Corrective Actions Available
3.1 Do nothing until after September 15, 1986
If we merely wait until the inevitable occurs, we stand the very good chance of even further memory deterioration with the attendant prospect of not being able to do anything about S/C attitude or onboard conditions. Erratic IHU operation will take place anyway; main battery discharge will occur. The AMSAT Satellite User Group will become increasingly frustrated and discouraged and begin to seek other interests after we fought so hard to get their attention in the first place. Knowing this organisation, I do not expect many votes for this option.

3.2 Perform Memory Diagnostics and Attempt a Patched Operating System
While there will probably be a significant amount of support for this alternative, there are good reasons to perform some tough objective analysis before embarking on this route. The time and effort to perform this task is indeed formidable. The chance of long-term success in this direction seems small, indeed. By the time a thorough memory analysis is performed (if it can even be done at all), further radiation damage will probably have already occurred, thus rendering the analysis useless. In addition, this activity would necessarily involve personnel who are already swamped with Phase-3C activities. Time stolen from Phase-3C could well lead to a situation of similar consequence a few years from now with the next satellite.

Power Down as Soon as Practicable
As long as the first three Bytes of memory remain functional, we should be able to uplink simple assembler language routines to perform one to a few functions at a time. It would be necessary to periodically run a memory diagnostic on at least a portion of memory as insurance. Some of the functions which are considered most important are:

3.3.1 Memory diagnostics
3.3.2 Limited telemetry
3.3.3 Transponder and beacon control (No transponder usage)
3.3.4 BCR service to control battery charge rates
3.3.5 Minimal attitude and spin-rate control

Functions 3.3.1 to 3.3.5 can probably be performed by the Ground Command Station (GCS) group with only minimal assistance from the spacecraft development team, thus freeing them to concentrate on 'hardening' the Phase- 3C bird.

Proposals, Rationale and Probable Benefits
With the information currently available to me, I propose that alternative (3.3) be implemented under the following conditions:

4.1 Bring the spin rate up to 45 or 50 RPM for maximum long-term stability.
4.2 Intentionally begin changing the S/C's attitude toward a -90 degree sun angle to shorten the total 'outage' period.
4.3 When the IHU supply voltage begins to drop below it's normal 10 volt level, activate the transponder and beacon, then load all of memory with a benign instruction code and 'hang' the CPU in a tight loop to minimise the chance for erratic behaviour.

The purpose of activating the transponder and beacon is to hasten the discharge process as much as possible, thus shortening the amount of time the IHU will spend in the potentially dangerous 'erratic window' region of supply voltage. Solected users would be encouraged to assist in this rapid discharge process by uplinking with a 100 percent duty cycle.

The benefits to be gained via this method are seen to be:

4.4 We reduce the time span where the IHU might perform a highly undesirable, unpredictable and uncontrollable action such as reducing the spin rate to 0 by activating all magnet coils in a DC state, rotating the antennas away from the Earth, overcharging the batteries by erroneously setting the BCR control latches, etc.
4.5 We at least have a chance of 'complete' recovery in a relatively short time frame which would serve to enhance AMSAT's stature in the eyes of the users, benefactors and the space agencies.
4.6 We reduce the numbers of satellite enthusiasts who will tend to abandon all hopes of AO-10's recovery and switch over to RS satellites as a permanent alternative.

While (4.5) and (4.6) may seem superfluous to the technical purist, in objective terms, it must be remembered that, without the support of these groups, our satellite service would (will) not exist!

Solicitations
Needless to say, there are many problems to be worked out and Murphy will see to it that major hurdles will present themselves, no matter which alternative is pursued. AMSAT consists of a diverse group of specialists covering a wide range of expertise. Your comments and suggestions are solicited immediately. If you feel your idea has merit, do not hesitate to send it along, no matter how 'wild' the scheme may sound. I cannot promise to reply to each and every suggestion or comment, but I do promise to study each and every one and present them to the appropriate parties.

73, Ron Dunbar W0PN, 6012 E, Superior Street, Duluth, MN, 55804

UOSAT DATA BOOKLET

A new, revised and enlarged edition of the UoSAT Data Sheets have been produced by the UoSAT team and is now available from AMSAT- Australia as a 40-skle booklet on receipt of a donation of $5 to AMSAT- Australia, C/- Box 1234, GPO, Adelaide, SA. 5001.

Contents are as follows:

Section	*Contents*
1	UoSAT-OSCAR-9 (UOSAT-1) Mission Summary
2	UoSAT-OSCAR-11 (UOSAT-2) Mission Summary
3	UoSAT-OSCAR-9 (UOSAT-1) Technical Data Summary
4	UoSAT-OSCAR-11 (UOSAT-2)Technical Data Summary
5	UoSAT Orbits and Tracking
6	UoSAT-OSCAR-9 (UOSAT-1) Spacecraft Data Formats
7	UoSAT-OSCAR-11 (UOSAT-2) Spacecraft Data Formats
8	UoSAT Whole-Orbit-Data (WOD)
9	UoSAT Spacecraft Telemetry Calibration Equations
10	UoSAT-OSCAR-11 (UOSAT-2) Digital Communications Experiment
11	UoSAT CCD Camera and DSR Experiments
12	UoSAT Ground-Station Equipment

There were 720 copies posted from UoS in the first week of June to all those on the UoSAT Mailing List. If you believe that you are on the list, please allow for postal delivery before requesting a copy as one may already be in the maill

PHASE IIIC LAUNCH SCHEDULE

The launch failure of a European Space Agency Ariane-2 rocket on May 30, will have some effect on the schedule for Phase-IIIC launch. AMSAT is manifested to fly the first Ariane-4 launcher this November. However, it is now certain the launch of Phase-IIIC aboard the V21 mission will be pushed into 1987. Ariane-space officials said it would be at least two months and up to six months or more before launches could resume.

Meanwhile, it has been suggested that AMSAT may take advantage of the schedule slack to effect some improvements in the satellite. For example, while improvements in the IHU radiation hardness has been discussed for months (long before the current IHU failure episode unfolded in May) a tight schedule limited efforts that could be brought to bear on the problem. Now, with an apparent launch stand-down of several months at hand, serious consideration is being given to rebuilding the IHU with newer, harder memory chips. The memory might also be increased from the current 16k to 32k. These changes would result in a more reliable, flexible IHU.

The delay in the launch may also allow refinement of other hardware matters that at present could use some tweaking. For example, the Mode S transponder efficiency might be raised.

de Colin VK5HI

SATELLITE ACTIVITY FOR THE MONTH OF MAY 1986

1. LAUNCHES

The following launching announcements have been received:

1986-033A (16717)	Cosmos 1742	May 14	USSR
1986-034A (16719)	Cosmos 1743	May 15	USSR
1986-035A (16722)	Soyuz TM	May 21	USSR
1986-036A (16724)	Cosmos 1744	May 21	USSR
1986-037A (16727)	Cosmos 1745	May 23	USSR
1986-038A (16729)	Ekran 15	May 24	USSR
1986-038A (16735)	Meteor 2-14	May 27	USSR
1986-040A (16737)	Cosmos 1746	May 28	USSR
1986-041A (16745)	Cosmos 1747	May 29	USSR

2. RETURNS

During the month 22 objects decayed including the following satellites:

1974-092A	Molniya 3-1	May 15
1986-051A	Exosat	May 06
1968-033A	Cosmos 1742	May 28

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QSP

MEMBERSHIP INCREASE

In the past 12 months, ARRL membership has increased to 139 910, a 10 000 member increase from last year. (The 1985 total was 129 698). As at May 31, 1986 there were 126 281 Full Members, 10 982 Associate Members and 2 638 subscriptions.

PACKET LICENSING

Digipeating and mailboxes are not now legal in the UK. The RSGB has been negotiating with the DTI for several months to try to find an early solution to this problem. Initial talks proposed that a frequency or frequencies on 70 cm be allocated to the packet network, but this was not allowed, because amateur radio is a secondary user of 70 cm. The other choices were to go up to the microwave bands or down to two metres. Two metres is very crowded in the UK (the band is only 2 MHz wide), and so this is not a long-term solution to UK packet networking needs. However, establishing a new mode on what would be for most people a new band (24 GHz is the first amateur primary band up from two metres) was equally undesirable. The compromise was to find two channels on two metres which could be used for a couple of years while packet radio gets started. These frequencies are 144.650 and 145.275 MHz, and they will be the home of the experimental packet-radio network until the end of 1987, at which time the network will move to another band.

From *Gateway*, Vol 2, No 22, June 27, 1986 and written by Jeff Ward K6KA. Jeff is a formor editor of *Gateway* and is presently working on the UoSAT project at the University of Surrey, England.

From left: Ken Guallager, Sam Voron VK2BVS, the Ambassador of Mexico, Martin VK2PJW and Colin Henderson. They were presented with Awards from the President of Mexico, Miguel de la Madrid, on behalf on the many amateurs who made disaster communications possible between Australia and Mexico during the 1985 Mexican Earthquake.

TECHNICAL MAILBOX

This month, the Technical Editors are pleased to introduce a new column to the pages of *Amateur Radio*. The column's intent is to provide answers to matters that may have bothered you for some time. In providing such answers, it will benefit us all. If you have a question, it would be safe to say that other readers may be in a similar predicament.

There will be no direct correspondence undertaken and all replies will be published in *Amateur Radio*. Naturally we reserve the right to refrain from providing a response where the situation dictates.

Keep your queries specific so our replies can be kept to a minimum without the need for diagrams. You can, if you wish, remain anonymous to readers.

We hope to keep you humorously informed!

Now it's up to you. Your feedback may well help to raise topics that could lead to a full-blown technical article written by an expert in that particular field. Your Editor is most adept in applying the thumbscrews!

Address your letters to *Technical Mailbox, Amateur Radio, PO Box 300, Caulfield South, Vic. 3162.*

Dear Jim VK4Z . ., Poeppels Corner, Qld.

I don't believe that increasing the height of your 144 and 432 MHz stacked Yagi arrays will result in the contacts you desire! Perhaps you should consider OSCAR 10 (when it becomes functional again) or even go the full circle and try EME. Even upgrading to AOCP would provide a HF outlet and a contact or two.

However, the method of feed you are using is far from optimum and explains why you have a slewed pattern and poor performance.

It is not good practice to use a half gamma feed on Yagi arrays especially when stacking is undertaken.

Your answer lies in providing a balanced feed. Here you have several options. Double gamma, Delta fed dipole, folded dipole or a folded dipole of differing dimensions. All of these will provide a balanced feed of varying, but adjustable impedance. Depending upon your feed line, be it coaxial cable or open line, you can then transform your feed impedance to match your line by means of a balun. Additionally, a Q-bar section can be used in difficult situations.

Coaxial cable baluns are simple to construct, broadband, and have a low loss if you do it right! Know your cable and its velocity factor and fashion with due care and precision.

Great! It works fine — until it rains! ! ! ! know you sealed it with silicone rubber and it still looks okay! Well Jim, you selected the wrong type. You should have used a non-toxic (inert) type. Generally speaking, this should be indicated on the tube — anyhow, your nose is a good guide. If you detect an acetic acid type smell, you can bet it is the wrong type. You can also obtain a pretty good guide (if you have a microwave oven) by putting some on a plate and placing it in the microwave for two minutes. If you cannot see across the kitchen for smoke it is not the correct type! This test, of course, should be undertaken with extreme care — wives are prone to become a little stroppy and show little understanding for such scientific research! ! !

Since you now have water in your balun and most likely the top half-metre or so of the feedline, despatch the balun to the bin, prune your feedline and start again.

Finally, long Yagis (over 3.5λ) have very low feed impedances (as low as five ohms in certain configurations). To minimise losses resulting from low impedance transformation, it is a good policy not to use balanced gamma matching, but stick to a folded dipole type feed. Use a 3:1 or 4:1 balun (as appropriate) to bring the feed impedance down to 50 ohms.

Remember a coaxial sleeve balun is always more efficient than a balun constructed from coaxial cable, and is well worth the effort if you are serious about performance.

Oh, and *don't* alter your first director or reflector spacings with respect to your radiator to obtain a match! Similarly, avoid television ribbon or open wire. Consider Belden 9914 (50 ohm coax). It is relatively cheap and its loss approaches half-inch heliax.

Dear Fred VK6. . .

Regarding your query for a high current 12 volt source to run your various pieces of equipment (IC751, IC251, etc).

Firstly, you were well advised not to get one of the units with the in- built 240 volt AC supply as it is true that the switched mode power supply can cause induced noise into the adjacent PLL circuitry.

I would suggest that your cheapest approach may be in obtaining a car battery of sufficient size (viz 60 Ah). Don't get one of the "torch batteries" found in most small cars these days.

Float the battery with a low current regulated power supply. There have been numerous circuits published and a pretty basic design will suit. Consider making it variable from 4.5-18 volts at approximately five amps and then you can use it for logic work if you are into this field.

Finally, remember to take special care of your battery by providing protection from acid spills, adequate and correct fuse protection, and sufficient ventilation. Remember the dangers when using such a high energy source.

Dear Newham VK4 . . .

No, the rig you obtained from the disposals source is probably not going to catch fire. From your description it appears that the red glow is coming from a device called an electron tube. You will most likely notice that this glass thing has a cap on its top. This is what is termed an anode. You should avoid contact with this as the voltage is much higher than the conventional collector voltage with which you are familiar.

Contact with this anode would reduce our amateur ranks by one!

Regarding the purple glow you have also mentioned I don't believe it is a radio-active source as you postulate but rather it is the glow emanating from a gaseous voltage regulator or mercury rectifier. The latter, if it also has a cap on it should be avoided, for this bites too.

These ugly things could be described as high voltage zener or silicon diodes with which you are undoubtedly familiar.

For further information try and obtain an early copy of the *ARRL Handbook* or contact a nearby Old Timer for advice.

Be careful, we hope to hear from you again.

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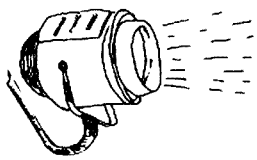
COMPUTER OPERATED AMATEUR RADIO STATION

Larry "Tree" Tyree N6TR, of Beaverton, Oregon, used what may have been the first completely automated computer operated amateur radio station during a Field Day this year.

N6TR made a number of CW contacts using a Z80-based computer and some experimental software which ran a TS-430 transceiver using battery power without the need for any human assistance. The software tunes the receiver, locates the station to call (it only answers CQs so far) completes that QSO, prints out a record of the contact and continues to scan for a new QSO. N6TR notes that there is still a long way to go before it can come close to matching a human operator!

From *The ARRL Letter*, July 7, 1986



Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Quite a lot of interest has been shown lately in new legislation, which has been enacted throughout the world, protecting the rights of utility users of the spectrum. This legislation aims to strengthen the privacy provisions of their traffic, and persons who intercept it and divulge its contents, face severe penalties. This will affect those who are primarily interested in Utility DX. Many have sent in reports to these services, hoping for a QSL card or verification. But now, these services are likely to ignore SWL reports, they do not need them anyway! Some utilities have complained to the national administration from where the report emanates, asking for action. This, I believe, has happened in some cases.

COULD BE CONFISCATED

Here in Australia, the new Radiocommunications Act is now law. This has stronger teeth than the previous legislation which had existed for some time. Under the terms of the new act it is illegal to have an unlicensed transceiver or sender. However, the DOC states that ownership of a transceiver by an SWL, who is genuinely studying for their licence, would not be an offence provided that the transmit-side is disabled; ie the final tubes or transistors are disconnected. As well, all transmitting equipment will be issued with an identification label by DOC which must be prominently displayed on, or near, the equipment. Equipment without this *appropriate* identification will be regarded as illegal, and be confiscated.

PREVENT SALES OF DECOOING EQUIPMENT

To protest their privacy many utility users are scrambling their signals, particularly on VHF/UHF Sales of scrambling devices are booming, particularly in Europe and the USA, with legislative back-up to prevent sales of decoding equipment to unauthorised Individuals or agencies. This is apparent on HF, that digitisation of phone traffic has increased, especially with military or sensitive agencies.

Although there is nothing to stop you listening in to these stations, I do strongly recommend that you keep the traffic to yourself, otherwise you could be in trouble. I further recommend that you desist from forwarding reports to these utility services, and concentrate on international or domestic broadcasters, amateurs or CBers, instead. It is interesting to note that possession of RTTY decoders and other ancillary equipment by SWLs is illegal in many countries. We are indeed fortunate in Australia. Let us not abuse that privilege.

HAPPY ANNIVERSARY

Two Australian DX Clubs recently celebrated their anniversaries: the *Southern Cross Club*, in Adelaide, had their 13th during July, and *DX Australia* also celebrated their fourth. The *Australian Radio DX Club* was 20 in June. Congratulations to all concerned.

AM-STEREO

Some months ago, I reported *Radio NDXE* had postponed their opening until later this year. Well, I received news that they are hopeful of commencing on October 15. No frequencies or times are available yet, but they should receive their Continental senders this month and operational tests should be heard. Don't forget they are planning to be the first station to use AM-Stereo on shortwave. They will be using the Kahn-system, which is different from the Motorola Am-Stereo on MW in Australia and the States.

Conditions of late have not altered significantly, although there are indications of an improvement. The sunspot count is slowly increasing. I must say that I am surprised that my puny 100 watts and G5RV get into Oregon consistently on the Australian-American Traffic Net, although at strength five. Stations further within the continental USA are unable to hear me, nor are they as strong as Troy K7OVK. Canadians are quite good also. Europeans are particularly conspicuous by their absence on 14 MHz, although 7 MHz propagation to that area is quite good at that time.

Signals via the Antarctic path were very disappointing around 0200 UTC this winter, certainly not as good as in previous years.

Well, that is all for September. It is good that Spring is here. We hope that conditions are improving. Until next time, the very best of DX and 73 — Robin VK7RH.

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

I recently canvassed opinions from Divisions and some groups about possible changes in arrangements for examinations. I would be interested in receiving a response from readers, too.

It has been suggested that the Institute should become involved in the running of examinations. Instead of the regular four examination dates per year, we would like to be able to arrange examinations to suit the classes and instructors. We envisage a Division *or group* with students ready for examinations being able to arrange a date to suit, with the venue being local high or technical schools, or such, arranged by the groups, and a non- amateur supervisor from the local community.

The time could be evenings or Saturday afternoons. The only participation required from the Department would be the provision of sealed examination papers, marking of the answer sheets and distribution of the results.

This system would increase flexibility and provide better service to the new recruits. Hopefully, it would also help to avoid further increases in examination fees, and also reduce the pressure on both candidates and instructors.

The CW examinations is of course more of a problem, but it should be possible to use tape recorders both ways!

Alternatively, there could be accreditation of reputable operators as CW examiners.

IS THIS PROPOSAL FEASIBLE?

Would amateurs be prepared to assist in making the arrangements, especially in rural areas? Can the system work for the few lone candidates in areas without active amateurs?

Another suggestion is that the WIA become the accredited examining body, to take complete control of all examinations, with DOC simply providing certificates on presentation of a WIA statement.

THINK AND TELL!

Please let me have you ideas on these proposals. Tell me all the problems you foresee — and the solutions, if possible.

It will, of course, be some time before such changes can be adopted if they are to be. For the present, one of the major complaints I receive from class instructors is the lack of access to the actual examination papers. We have been negotiating with DOC about this, and it has been agreed that an Institute representative should have the opportunity to read the papers, either on the day of the examination or within a day or so afterwards.

Arrangements should be made in advance with the local State Office of DOC, and any comment or criticism should go formally through the Institute.

At the time of writing these notes, we have not had this as a formal policy statement, and it may not have reached all State Offices yet. But it is probably worthwhile for Divisions or groups with local examination centres to inquire about the possibilities. In the larger centres, I would expect the groups running the classes to arrange between themselves who would be the representative for a particular examination. In this way, we would be able to keep more check on papers, I would receive useful comments and instructors would no longer have to rely on the memories of the candidates for feedback on their courses.

I look forward to hearing from you!

73 Brenda VK3KT

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

Amateur Radio and *Electro- Magnetic Compatibility*

It has been over a year since we had a regular EMC column in AR. While Tony Tregale VK3QQ, was in the position of EMC Co-ordinator, his monthly column frequently included material supplied by Hans Ruckert VK2AOU. We now have pleasure in introducing Hans as a regular columnist. Although he is not in a position to take over fully the job of EMC Co-ordinator, he will keep us up-to-date with developments in this area, particularly those reported from West Germany, where progress in establishing EMC standards is well advanced. — Ed.

Recent events have shown that we still have a long way to go before EMC legislation here and overseas protects the radio amateurs' right to use transmitters as specified by the licence and regulations, in spite of some common law interpretations to the contrary.

To meet the desire of Executive to continue the EMC column in *Amateur Radio* this writer intends to carry on some of the work done in the past by VK3QQ. Proposals are:

1. A series of papers for AR on EMC will be prepared, which may be used by radio amateurs to defend their right to transmit. It is suggested that WIA members keep these papers. Copies if necessary can be given to:
- Complaining neighbours
- Service departments of electronic entertainment equipment firms
- Radio Inspectors
- Solicitors acting for or against radio amateurs
- And to other members of the legal profession.

The papers will be a source of information on the background and technology of EMC. Members may keep these papers in a folder as *Amateur Radio EMC Defence Kit*. It should be possible for interference cases to be resolved peacefully, avoiding costly and anti-amateur court cases. The papers will explain to all parties involved why government action (Communications Act, section on EMC Immunity Standards) is necessary for the co-existence of all users of the radio frequency spectrum.
2. The most effective demonstration, that a legally operated transmitter does not interfere with correctly designed electronic appliances, can be made, if we put our house in order. To achieve this we must avoid the purchase of appliances which are not immune to a reasonable degree or cannot be made immune to unwanted but legal transmissions on totally different frequencies. With sufficient support we could compile a register of appliances (television, broadcast, video recorder, etc) which are affected by legal transmissions, to warn others who intend to purchase these appliances. The same goes for appliances (computers, television sets, etc) which cause interference to our receivers on amateur frequency bands. If sufficient information can be obtained several organisations may be interested — dealers, manufacturers, DOC, consumer associations, the Department of Consumer Affairs.
3. Reports on successful cases where appliance service departments and radio inspectors (local or overseas) have overcome EMC problems. Members — please let me know.
4. Details of EMC standards and testing methods developed in West Germany, to be passed on to the ITU, DOC Australia and involved organisations.
5. How radio inspectors and the Post Office (FTZ — DOC) in West Germany deal with EMC collision cases.
6. High-pass, low-pass and line-filters — what they can and what they can't do. Ferrite suppressors.
7. Video Recorder (VCR) EMC problems (by DL1BU, honorary technical officer of the DARC).
8. VCR-EMC Standards (by DL9TJ, EMC specialist of the Ministry of Science and Technology).
9. Reported court cases, where the blame was placed where it logically belongs (precedents for future decisions).

It is not the fault of the radio amateur service, that immunity standards already introduced or contemplated in some countries were not in force 50 years ago for broadcast sets and 25 years ago for television sets. This would have protected the unaware non-technical public from purchasing appliances which are incompatible with other services (not only amateur radio). This is a problem of our technological times. Party politics and economics have nothing to do with it nor can they help. Australia is not "a different country," as far as EMC of services and appliances are concerned. Some conscientious overseas manufacturers have already achieved EMC immunity levels (TV-VCR, etc) considerably better than the now legal requirement of three volts/metre in a field strength test-cell.

It has even been found that by selecting the correct earthing points on the chassis (if there is one), the number of components and the production cost could be reduced. By such measures the chassis becomes "cold" for RF, enabling shielding to be effective, as many radio amateurs have known for years.

In spite of these long overdue achievements there are millions of appliances in service, either locally manufactured, imported by dealers or brought in by travellers prior to the adoption of immunity standards. Such devices cause the public and the transmitting services a great deal of trouble, and produce frustration among radio Inspectors and radio amateurs.

EMC REGISTER

The purchase of equipment or appliances, which cause EMC problems is not in the interest of the Amateur Radio Service nor of the public. If you wish to support this program, cut out or photocopy this part of the page, fill in your particulars, and post to H F Ruckert, 25 Berrille Road, Beverly Hills, NSW. 2209.

EMC Register — Receiver Interference
Which electric/electronic equipment of your own and/or of your neighbours causes interference to your shortwave reception due to excessive (perhaps illegal) radiation?

Type	Make	Model	Frequencies Affected

EMC Register — **Transmitter** Effects
Which electronic/electric equipment of your own and/or of your neighbours is affected by your legally operated transmitter most likely due to lack of immunity/selectivity of the appliance?

Type	Make	Model	Affecting Transmitter Frequencies

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW 2868

With the ALARA Contest fast approaching, I thought it would be a good idea to start getting a little CW practice in, only to discover, when I located my key, several centimetres of dust and a little cobweb! A rather sad confirmation of the fact that I do not use it often enough.

I suppose many of us, on attaining the dizzy heights *of the* full call after *much* time and effort, do tend to consign our faithful CW key to a remote corner of the shack, knowing that examination is behind us and there is no longer a compelling need to keep up the practice. We tend to forget that there is a whole new "CW World" out there for us to conquer.

Back to the novice YLs and the ALARA Contest, and of course, the Mrs Florence McKenzie CW Trophy, to be awarded to the novice YL with the highest CW score. (Not necessarily an ALARA member). The minimum score is 50 points, and when you consider that CW contact points are doubled, you have only to contact five ALARA members on CW to be "in the running." Don't be put off by the fact that many of the girls are full call members. They will be more than happy to adjust their speed to yours. Last year, many OMs also were looking for CW ALARA contacts, and no doubt this year will be the same. How about giving yourself a chance to win this unique award?

While on the subject of the ALARA Contest, we would like to thank Ian VK5QX, the Federal Contest Manager, for publicising the event, in June AR. However Ian, these days we do a lot more than just assist the OMs and provide food, etc. (See ALARA Column, August AR).

ACTIVITIES

Activities held in connection with our 11th birthday included:

VK5 Get-together Luncheon on July 20.
VK3 Get-together Luncheon on July 27.
Birthday Activity Day on July 26.

The AGM was held on August 26, with a few changes to the Committee.

The Office Bearers are:

Marilyn Syme VK3DMS	President
Jennifer Warrington VK5ANW	Secretary/Vice President
Val Rickaby VK4VR	Treasurer/Souvenir Custodian
Margaret Schwerin VK4AOE	Vice-President
Mavis Stafford VK3KS	Award Custodian/ Historian
Marlene Perry VK2KFQ	Contest Manager
Meg Box VK5AOV	Minute Secretary
Bron Brown VK3DYF	Editor
Bev Hebiton VK6DE	Librarian
Jessie Buchanan VK3VAN	Sponsorship Secretary
Joy Collis VK2EBX	Publicity Officer

State Representatives

Bobbie O'Hare VK2PXS	VK1 and VK2
Bron Brown VK3DYF	VK3
Margaret Schwerin VK4AOE	VK4
Meg Box VK5AOV	VK5 and VK8
Poppy Bradshaw VK6YF	VK6
Helene Dowd VK7HD	VK7

We would like to thank the retiring office bearers, in particular Helene VK7HD, Marlene VK5QO and Valda VK3DVT for their untiring efforts they put into ALARA's progress, and also wish the office bearers, old and new, a very successful year.

ALARA AWARD

Award number 119 was awarded to Alan G Hughes ZL3KR, on June 11, 1986. Alan's award was endorsed all 3.5 MHz SSB.

CORRECTIONS AND AMENDMENTS — Membership List, July AR

The following call signs were incorrect:
Jan VK2CJN, Chris VK4ABM, Cecily VK4QW, Shirley WD8MEV.

Omitted from the list were:
Kirsti VK9NL — joined June 1, 1980
Bobbie VK6MH — joined December 14, 1976
Peggy VK6NKU — joined February 15, 1983

Apologies for any inconvenience caused.

From left: Lori VK4FFQ, and Val VK4VR.

Alice Epperson KD7SH.

WIA 75 ANNIVERSARY MEDALLIONS

I have been notified of the award of two more medallions to ALARA members, which were omitted from the original list in June. They are Barbara VK3BYK, VK3 Inwards OSL Bureau; and Gwen VK3DYL, (and family).

Congratulations Barbara and Gwen. Sorry you were missed from the original list.

1986 YL CONTESTS

Howdy Days — September 3, 1400 UTC to September 5, 0200 UTC.
IX International Contest 1986 — September 27, 1300 UTC to September 28, 1300 UTC.
15th JLRS Party Contest —
Phone: September 27, 0300 UTC to September 28, 0300 UTC.
CW: October 4, 0300 UTC to October 5, 0300 UTC.
YL Anniversary Party (YLRL)
CW: October 15, 1400 UTC to October 17, 0200 UTC.
SSB: October 29, 1400 UTC to October 31, 0200 UTC.

That is all for now — see you next month.

73/33, Joy

Remember the ALARA Contest on November 8, 1986

Dulcie Hornsby VK4BDH.

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

(G) General (C) Constructional (P) Practical without detailed constructional information (T) Theoretical (N) Of particular interest to the Novice (X) Computer Program

VHF COMMUNICATIONS, 4/1985 — Micro-Stripline Antennas (T). Micro-Stripline Formulas (T). Power Amplifiers (P). Transverter 144/1296 (P).

RADIO COMMUNICATION, June 1985 — 1985 Convention. Dual Conversion IF AF Strip (C). UHF/VHF Front End Design (T). Modifying Capacitors for Transmitting (P/N).

RADIO COMMUNICATION, May 1986 — RSGB News Bulletin (G).

CQ, March — Microphone Interface/Oscillator Unit (C). Antenna Length Chart (G). DC Speed/ Power Control (G).

RADIO COMMUNICATION, June 1986 — BLW96 Linear for 50 MHz (C).

CQ, April 1986 — Special Antenna Issue. Shortened Vertical for 20 and 30 metres (C). Loop Array for 160 metres.

73 MAGAZINE — W2NSD/1 Editorial (G). Amateur Behaviour (G). Loop Antennas (P/N) Universal Digital Frequency Display (P).

OST, April 1986 — Switched Capacitor Audio Filters (C). Coil Inductance Tester (C/N). Gravity Gradient Modulation (A/F). USA Spread Spectrum Rules (G). Great Armadillo Run. Broadband Antenna for 80/75 metres. 160metre Linear-Loaded Sloper. Tune-up a Tribander.

WORLDRADIO, April 1986 — Amateur Emergency Services (G). First QRP WAC Certificates (G). Packet Radio. General World Amateur News and Views.

SHORT WAVE MAGAZINE, March 1986 — 50th Year of Publication. 80 metre CW Transmitter. (C/N). Low Cost Linear using 813s (C). Infinitely Variable Polarisation Devices for OSCAR.

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

Here it is, mid-July and freezing cold at Buronga as I write this column. It is probably the weather that has kept me away from the typewriter, but I would like to finish the story of Morotai, the beetle-shaped island in the Halmaheras, located at two degrees, 20 minutes north, 128 degrees, 25 minutes east.

Whilst on this island, the soldiers of World War Two were continually complaining of the incessant torrential rain, the high humidity, the bully- beef, powdered potatoes, chlorinated water, atebrin tablets and the anopheles mosquitoes (the ones that carry malaria — even though I never knew anyone who contracted malaria there due to the intense anti-malaria precautions that were taken by the Army).

I have already mentioned the war trials that were held on Morotai and the subsequent punishments carried out at locations which were top secret.

I have forgotton so many things that were part of our existence there, but occasionally I remember them and may write about them again from time-to- time. (Hopefully, I will not be guilty of writing about the same thing twice!).

DROPPING NAMES

There are some names that I still remember from those days, such as Major Cheong, who was editor of the army newspaper *Table Tops*, when first news of the end of the war was received. Then there was a Lieutenant Taylor, who merits a mention because he was Orderly "room" (hut) Officer, (it was his signature I got a mate to forge on the middle pages of my AAB83 paybook when I desired an extra 14 days leave on my return to Sydney).

When I later transferred to the Army Amenities Radio Station, 9AD, there was a Lieutenant Miller as OC of the station, Warrant-Officer Barnett, who was well-known to his 2CH Sydney pre-war listeners for his ability to play the organ. WO Barnett was one of our announcers and I believe in later years he became the organist at the *Regent Theatre*, in Adelaide. And there was Lionel Court from Western Australia, who was in charge of the technical-side of radio 9AD, and managed to get the station back on the air on the morning when I blew the main fuses and threw everything into confusion when the electric jug I was using short-circuited!

USING CHALK MARKS

Radio station 9AD was on 1440 kc (kHz) and operated with power of 200 watts which was generated by a pair of 20 kVA generators working alternate days. The generators also had to supply power for about 400 camp lights.

Pre-recorded shows, well-known to mainland listeners at that time, such as *Yes, what?*, the *Cashmere Bouquet Show*, *Pick a Box*, *Mrs 'Obbs*, *Dad and Dave*, etc were sent to the station on large discs. Some of these discs contained commercial advertisements which had to be edited out by WO Barnett in the record library prior to the disc going to air. He did this by listening to the disc the day before it was to go to air and placed white chalk marks on the place where the advertisement began and ended. When the program went to air, he merely had to lift the pick-up from one chalk mark to the next to delete the advertisements. (The army would not appreciate advertising material on its radio station in a war zone with the soldiers having nowhere to buy the products advertised — anyway, who wanted boot polish when no one polished their boots!).

DUMPING PROCESS

With the conclusion of the war in the Pacific, there was a lot of equipment on Morotai and nothing to do with it. I had travelled to Morotai on an American troop ship, the *Frederick C Ainsworth*, from Brisbane. I did not arrive back in Australia until many months after the end of the Pacific war on the *Kanimbla*, a Malcolm McEachern Line Passenger Vessel, which, with its maritime broadcasting station 9MI on board, was familiar to pre-war shortwave listeners on the 49 and 25 metre bands as the ship travelled around our coasts.

The equipment on Morotai was dumped as it would have occupied valuable space to bring it back to Australia. Things like staff cars and jeeps were dumped into the sea. Before we departed, a friend and I set up a business to repair radios (with scrounged parts) for the units who were bound for Kure and other places where the British Commonwealth Occupation Forces (BCOF) went to. After leaving Australia these troops were on Morotai for a time before moving on to Japan. There was a large aircraft dump on Morotai and my friend and I found this to be the location where we could get plenty of wire (wire was in short supply on Morotai). We would head off to the dump armed with side-cutters and pliers.

The dump was frequently partially filled with tropical rain, and we would check-out 40 or 50 planes, often walking on the wings of one plane to climb onto the fuselage of another in our scrounging. Unfortunately for us, the RAAF personnel who had fished these planes out of the sea had usually gone through them pretty thoroughly and all the valuable equipment had been removed by the time we arrived. All we could get was miles and miles of plastic-covered wire, which was the first of its type that we had seen.

Other troops visited the dump and their main interest was Perspex, which was in great demand to make "souvenirs" to send to their home-folk, or to the American GIs. Souvenir Japanese swords were especially manufactured and *stained* to look like the genuine article. These were sold to the Americans for Dutch Guilders, the currency on Morotai. Also, the two bottles of beer that were received each week were also sold to the Americans for more Guilders and Cents than we had paid for them.

SOUVENIRS

The only relic I now have is a genuine Japanese Samaurai NCO Sword. I got it whilst I was at 9AD. After the end of the war, and in particular the surrender ceremony, when nine Japanese officers relinquished their swords to General Blamey, masses of swords, guns, etc were distributed to us on the island. This was when I acquired my sword. The only war-like duty it has performed in the intervening years has been to chisel open a locked door at my residence at Buronga. I did have other souvenirs of those days, including the famous issue of *Table Tops*, dated 15 August 1945, and an official photograph of many of us at the Surrender Ceremony, but they have vanished over the years.

Very soon I will write about the trip back to Australia and the things that happened to me in the post-war years in Sydney. Thanks to all who have complimented me on these articles on air, it is very much appreciated.

73, Joe VK2BJX
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CORDLESS TELEPHONE BUYERS WARNED OF ILLEGAL UNITS

A spokesman for the Department of Communications has warned buyers of cordless telephones to be on the lookout for illegal units, as the has been reports of unapproved units being imported and sold. These units can cause interference to other radio communications services including radio and television broadcasts.

Use of the unapproved telephone is an offence under the *Radiocommunications Act 1983*. Substantial penalties including confiscation of the equipment could be imposed.

All cordless telephones used in Australia require both Department of Communication and Telecom Australia approval and it should display approval numbers from both organisations along these lines:

Telecom Authorisation
No. C85/35/24

Department of Communications
No. DOC 302 0999
(or RFM E002 0999)

People who have unknowingly bought an unapproved cordless telephone can seek recompense from the supplier under Section 53 of the *Trade Practices Act 1974*.

Buyers unsure of the status of the cordless telephone should contact any business office of Telecom Australia or any office of DOC.

Club Corner

WESTERN AND NORTHERN SUBURBS ARC

The 7th Transport Squadron of the Army Reserve will be attending the monthly meeting on September 5, to present a view of a reservists life to members of the club and included in the night will be demonstrations of Army equipment.

On September 13, 1986 the Western and Northern Suburbs will be holding the annual *Hamfest*, between 10 am and 4.30 pm.

The October meeting will see an interesting talk about VHF/UHF Propagation using aircraft enhancement, presented by Doug McArthur VK3UM, a Technical Editor of *Amateur Radio* and an exponent of this form of propagation.

All visitors, friends and members are invited to attend these events. Visitors are made most welcome.

BALLARAT AMATEUR RADIO GROUP

On November 1 and 2, 1986, the Ballarat Amateur Radio Group will again be conducting a *Hamvention* at the Sebastapol Football Club-rooms.

Readers of *Amateur Radio* are cordially invited to take part in the activities which will be held over the weekend.

This years *Hamvention* will be different to previous years. The theme for the event will be Amateur Satellites with a guest speaker from interstate talking on the Saturday night.

A couple of new events, like a high speed CW receiving contest, will be part of the event.

Readers interested in taking part in the *Hamvention* are requested to complete the circular which will be an insert in a later AR, or contact the Group at Box 216E, Ballarat East, Vic. 3350.

Contributed by Murray Felstead VK3AAI

SWAN HILL DISTRICT RADIO CLUB

The two-metre repeater of the Swan Hill District Radio Club, VK3RSH, became operative in 1975. Originally it was decided to adopt the common receiver, transmitter, and antenna system with associated cavities, as described in ARRL publications.

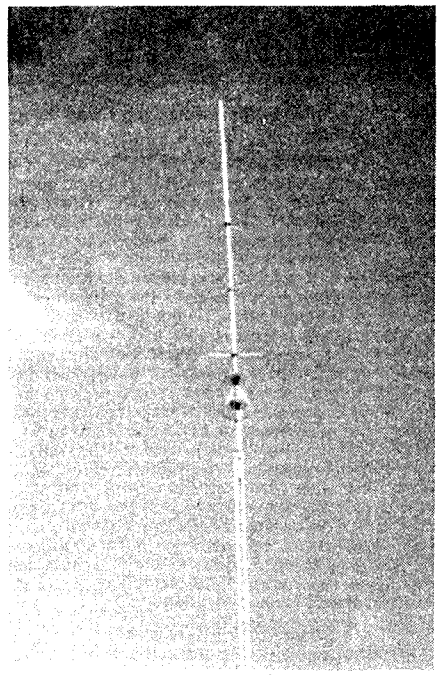
The electronics system was home-brewed, mainly from kits available at the time. The 146.900 MHz transmitter was capable of 25 watts output and the receiver was capable of good performance. However, receiver sensitivity was limited by an over present de-sensing problem caused by the inability of the cavities to provide adequate isolation.

VK3RSH was originally located at the home of VK3BM, within the city boundaries of Swan Hill. Even with an antenna height of 36 metres, mobile operating range was limited to about 25 kilometres, so in 1984, for various reasons, it was decided to relocate the repeater to a clear area, five kilometres from town, with the antenna elevation remaining similar to the original location. The collinear antenna was replaced by an omni-directional array of four phased folded dipoles.

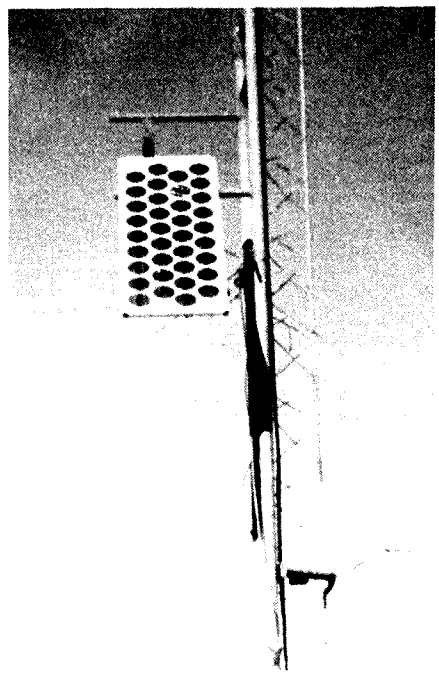
No AC power was available so a solar cell bank was installed. Two bunkers were constructed — one for batteries and the other housing the electronic equipment, plus the six cavities. The receiver signal-to-noise ratio was improved and the mute section was updated. But, it was all to no avail — receiver de-sensing.

Simplex tests were then carried out, using the repeater antenna system. Even with a disappointing SWR of 2.4:1, results indicated that the mobile range should exceed 40 kilometres.

The possibility of a dual vertical antenna system



The antenna set-up showing the discone under the G6144A.



The solar panel mounted on the tower.

had previously been discussed and it was decided to do some experimental work on such a system. Results were encouraging.

The receiving antenna was mounted 1.5 wavelengths above the transmit antenna resulting in 48 dB of isolation. One conventional inductive notch cavity was installed in the receiver input and a shunt mode capacitive notch cavity was installed in the transmitter output. Power loss for the shunt cavity was .25 dB as against .8 dB for a series type.

The receive antenna has a gain figure quoted at 6 dB over a dipole. The transmit antenna is a modified discone with a probable gain of 1.5 dB.

A low SWR for both the receiver and transmitter antenna is essential to prevent coupling between associated coaxial cables. No special precautions

Bunkers in which the repeater and batteries are housed.

are then necessary regarding cable orientation except for the short length from the receive cavity to the receiver input.

The feature of this system is that the repeater has a slight receive function advantage, exactly the opposite situation existing with the common receive/transmit antenna previously in use. There is no receiver desensing.

As random noise output from the transmitter has no effect on receiver performance, an audio peak limiter is employed to maintain a satisfactory deviation index.

The undulating terrain of the Victorian Mallee and adjacent New South Wales Riverina has no high vantage points. Mobile tests now show a reliable omni- directional mobile range of 50 kilometres with better results under favourable conditions. Base stations at Robinvale, 125 kilometres distant, regularly access the repeater.

Installed solar cell performance is highly variable due to daily and seasonal fluctuations in light intensity. Absolute maximum charging rate is 2.4 amps. Under cloudy conditions, even in mid-summer, output can drop to a maximum of .75 amps. The receiver and control circuitry current consumption is .3 amps. Internal battery leakage is about .1 amp, so careful monitoring of the battery charge level will be necessary.

A new identification system, using CMOS technology, has been installed and perhaps a new receiver, with reduced power consumption should be considered.

Variations of the antenna system have yet to be researched and one that comes to mind is the use of the discone as the receiver antenna with a notch filter and RF pre-amplifier mounted under the cone for protection.

It is still too early to ascertain the stability of the two notch filters in their bunker environment. They are stored in a cabinet lined with greasy wool. Wool is still probably the best and most durable thermal insulating material available. One thing is certain, the 48 dB antenna separation is a constant factor.

The Swan Hill and District Radio Club hope that their two-metre repeater installation is now capable of stable operation and improved performance for the future.

The Major Mitchell Award, celebrating Swan Hill's 150th Anniversary, is available to those amateur stations which fulfill the necessary requirements, see page 42, April AR, and contacts via the repeater involving Swan Hill Club members are eligible for the Award.

Written by Doug Loft VK3ZOX and contributed by Jeff Baber VK3DUJ, Secretary, SHDRC

SWAN HILL DISTRICT RC

When the Swan Hilt District Radio Club Repeater, VK3RSH, is now operational from its new location and the Club Repeater Officer, Doug VK3ZOX, presented a full report of its modifications to the AGM in early June.

Rex VK3OF, Immediate Past President, commended Doug and those involved with the repeater as well as those who were involved in Club activities during the past year.

Daryl VK3AMJ, takes over as President for 1986/87 and Jeff VK3DUJ, continues as Secretary.

Club meetings are held bn the first Thursday of the month at the Swan Hill Technical School and visiting amateurs and SWLs are always welcome.

Contributed by Allan Fountain VK2YAH, Publicity Officer, SHDRC

HORNSBY AND DISTRICTS ARC

At the AGM of the Hornsby and Districts Amateur Radio Club on May 27, 1986, the following Committee Members were elected:

President and Education	Tony Lamacchia VK2BTL
Vice-President	David Ramsay VK2KLX
Secretary	David Priday VK2CDZ
Treasurer and QUA Editor	Trevor Smith VK2ECD
Publicity Officer	Colin Christie VK2PLV
Emergency Communications and Morse Machine	Barry White VK2AAB
Library and QSL	Ted Davies VK2ZED
Repeater	Gareth Davey VK2ANF
Council Liaison	Jeff Page VK2BQ
Club History Project	Keith Alder VK2AXN

Meetings are held on the fourth Tuesday of each month at the Asquith Sports Club Hall, Old Berowra Road, Hornsby.

Club Nets are held on Mondays, 1000 UTC, 28.370 MHz (sometimes on the alternative frequencies of 3.615 and 147.250 MHz), watch for VK2APF. All welcome to join in!

Information supplied by David Priday VK2CDZ, Secretary, HADARC

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DEVIL NEWS — from the North West

The last meeting of the Club saw 23 members and two visitors present, with apologies from VK7s KY, AR and OL. Guests were Barry VK7FR and Joe VK7JG. Joe was representing State Council, being Guest Speaker for the night.

During the course of the evening, Joe advised that instead of State Council paying for repeaters VK7RNW, VK7RAA, etc, each Branch will be responsible for their own local repeaters. This matter will be discussed further at the next State Meeting.

Noel VK7EG, requested the AGM month being changed and referred to the relevant constitution reference — this matter is now to go to State as a Request of Change.

Bruce, the Treasurer reported that the financial position was satisfactory.

Andrew is having success with repeater VK7RAD and has had it running on test at his QTH. It looks as though it will not be too long before it will be installed on the mountain top.

The new room at the High School is still progressing well and is becoming more homely with a donation of carpet from Don VK7DP and coffee mugs from Andrew VK7ZAP.

The News Co-ordinator requests to hear from people who are willing to do relays for him when the North West has news — please ring Arthur if you can help.

There was considerable discussion when Ron VK7RN suggested that the broadcasts were not as good since they had been taped.

Joe VK7JG, spoke about Federal News and advised that the Federal Office has opened a Bulletin Board using a computer modem and suitable program for receiving news.

He also spoke about examinations and the 1988 Federal Convention, which will be held in Canberra.

Thanks go to Greg VK7ZBT for his assistance with these notes. If any other branch members have any news please contact VK7KY, QTHR.

Contributed by Max Hardstaff VK7KY

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WAGGA AMATEUR RADIO CLUB

This year's Convention at Wagga Wagga will be held on the weekend, October 25 and 26, 1986.

The Annual Wagga Wagga Convention is the Club's premier event. Trade displays from Sydney and Melbourne will combine all the major equipment manufacturers — the trade displays always help the event to be such a success.

Last year, Icom donated a transceiver as a major prize.

Accommodation for this year's event will be detailed in October AR. Come along and enjoy yourself. Everyone welcome.

Contributed by Peter Clee VK2KZZ

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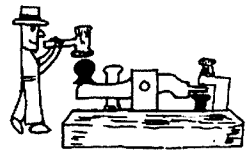
THOUGHT FOR THE MONTH

Tough times never last — but tough people do!



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

Time certainly gets away from you doesn't it? These columns are serially numbered, so I can keep track of what gets printed, when, and although the serial number doesn't appear in print, it is staring at me from the screen as I write this. This is number 49, which means the column is now in its fifth year. Actually, in case anybody else is counting, it is in the second month of the fifth year because we somehow missed the deadline one month and everything got rolled over.

As usual, I have no trouble in finding things to write about — but have difficulty in working out where to start, so let us start with the good news.

The response to the suggestion that there should be a CW "Sprint" contest was overwhelming. Not just from fellow brass-pounders, but from phone operators who feel that if it is good enough for CW, it is good enough for phone. So . . .

As occasional (and current) President of the Adelaide Hills Amateur Radio Society Inc, it gives me great pleasure to announce that the Society will organise the inaugural "National CW Sprint" on Saturday, November 15, 1986. The CW Sprint will be followed on Saturday, November 22, 1986, by the inaugural "National Phone Sprint." It gives me equally great pleasure to announce that the Sprints have the endorsement of the South Australian Division of the WIA, which will provide trophies and certificates.

Ian VK5QX, assures me that the full rules will be published in his column in October, but don't worry — it is not complicated. The whole thing is designed according to the KISS Principle (Keep it Simple, Stupid). The Sprints will be nation-wide, for an all out hour and a half on Saturday night on 80 metres. One point per contact (no repeats), whether it be a fellow VK, a JA, a BY, or whatever. There will be an outright winner in each Sprint, and certificates for the top scorers in each call area. Certificates will also be awarded for "special merit" so if you want a real challenge, try QRP or mobile.

Those of you who read *Pounding Brass* regularly will recall the reason for suggesting the CW Sprint was that the established contests are too long and have too few CW participants to be really enjoyable. An hour and a half should not be enough time to work all of the participating stations, so the emphasis will be on operating skills.

There might be some inclination for slower operators to feel disadvantaged — don't. I am sure that all participants, being gentlemen knights (and of course ladies) of the Key, will follow the Golden Rule of speed and slow down to work slower operators. Besides — what better incentive to get your speed up?

On another subject, I promised to report on the club's visit to the OTC Coastal Radio Station, at McClaren Vale (Adelaide Radio, for SWLs). Well, I am going to beg off for another month because the manager of the station, Fred VK5YK, is coming to speak to the club in a couple of weeks and I want to check some facts and figures with him. It was a real eye-opener, especially to see the transmitter room. But more about that next month.

You may recall discussion of the K P Thomas Automorse Mechanical Key in this column in recent months. Well, at the last WIA Buy and Sell I became the proud owner of one. It is a weighty beast — about two kilograms — and quite complex. At a guess it would have around 100 actual parts, and there are 20 screws provided for adjustment. There are three paddles; automatic dots, automatic dashes, and manual dashes.

When I first got the Automorse it was in a pretty sad shape. It was dirty, and would not do anything except "clank" when I picked it up. Given the number of parts, it was a fairly long and drawn-out process to disassemble, clean and reassemble it, but it was worth it. It responded well to a bit of *Brasso*, but some sort of dip cleaner would have been a lot easier. Unfortunately, I don't know what the metal is. It looks a bit like what we used to call "German Silver" or nickel-plated brass. It does tarnish, but it is not silver. The colour is a bit warmer than chrome.

Anyhow, it looks a treat now! So good that I have decided to build a museum-case for it. Of course, appearance is not the only reason it belongs in a museum case . . .

Adjusting the Automorse is not as difficult as I was afraid it might be, given the number of adjustments, because after all, the basic principle is quite simple. The paddle releases a spring pendulum and the speed of oscillation is a function of the length of the arm and the weight at the end of it. The dot lever carries three sliding weights, and the dash lever has two. In addition to the position of the weights, you can adjust the spacing between the contacts, the position of resting and limiting stops, and the tension on the paddle.

Once it is going (about three hours' work hooked up to a keyer) it is simply a matter of matching the timing and weighting of the dots and dashes. Having done that, and bearing in mind that the *slowest* speed possible appears to be around 18 WPM, *it is not something that can be changed quickly on air.*

Since I am used to a Bencher paddle, I find the Automorse pretty crude in terms of effort required to generate a couple of dits and dahs, but I have played with it enough to see that one can get used to it, and it certainly represents an improvement over a manual key at high speed. Using any keying device is a matter of forming new habits. I note for example, that it took me a long time to start using the iambic keyer in its iambic mode, and the final technique is something of a combination. Perhaps it is a matter of practice, and/or adjustment, but I find the auto-dash facility on the Automorse is only useful for sending two or more dashes in a row (single dashes sent with the manual dash paddle).

Neville VK7NC, is another amateur who likes playing with keys. His efforts are more to the constructional side, and he asked for some assistance with building a paddle on the Bencher design. The Bencher was due for cleaning and adjustment, so I pulled it down and cleaned it, and photographed it in various stages of reassembly for Neville, who should be well on the way to having a new paddle by now. As I have said in this column before, the Bencher is an intriguing bit of engineering, and I might print the photographs in the column some time if anybody is interested.

That seems to have pretty well filled the space for this month. Don't forget about the Sprint — get in some practice while you can because I think that trophy would look great on *my* shelf!

ar

QSP

CB VIOLENCE

An 11-metre CB transceiver in La Habra, California, has been shot to death by an armed intruder.

Dennis Carrico was talking on his CB set after midnight when he sensed he was no longer alone. Carrico turned and saw a stranger with a gun standing over him. The gunman ordered him to turn off the CB and move away from it. Carrico obeyed, after which the visitor shot it three times and quietly left.

Carrico was not harmed but his transceiver was destroyed. Police theorise that the attack was in retaliation for TVI.

From *The ARRL Letter*, July 7, 1986

A R Showcase

TEGA ELECTRONICS

Recently in Melbourne, two soon-to-be ex-servicemen, found that there existed a need for a repair facility to cater for users of communication equipment and test equipment.

The two principals, Terry Collins and Gary Townsend, have between them, almost 40 years experience in the Military Communications and Radar field.

Terry has extensive experience with Satellite Earth Stations, being trained in the USA and subsequently being responsible for the repair and maintenance of a major Earth Station. More recently, he was responsible for the repair of Military Communication Equipment in south-east Australia by civilian firms.

Gary has taught electronics to apprentices for almost eight years and recently, for the past five years, has been responsible for the repair, maintenance and calibration of test equipment in south-east Australia. A very active amateur, Gary has an extensive VHF, UHF, and microwave station and is keenly interested in long-haul communications.

The new business is located in Montmorency, and will be able to provide the "personal touch", so often missing these days. An extensive range of test equipment is on hand to provide the best back-up possible. Most types of communication equipment can be maintained without the need to send your "pride and joy" interstate for service.

Call in and see Terry and Gary at 75 Grand Boulevard, Montmorency, Vic. 3094.

ar

IPS TRAINING COURSES

For those amateurs interested, IPS are running training courses on a one day basis. The course consists of three lectures covering various subjects. Generally the course is aimed at HF communications, but the presentation can be tailored to suit the audience.

Courses are normally conducted from 9.00 am to 3.00 pm and are presented in Sydney during September each year.

Cost of the course is $55 and further information may be obtained from PO Box 702, Darlinghurst, NSW. 2010 or phone (02) 269 8555.

ar

FREQUENCY MEASUREMENT

Associated Calibration Laboratories Pty Ltd, recently obtained certification as National Association of Testing Authorities (NATA) approved laboratory for frequency measurement. This is in addition to their current NATA certification in various areas of acoustic calibrations and surveys.

A unique feature of the reference frequency system is that it is phase locked to Omega VLF transmissions which have an accuracy of one part in 10^{12}.

Allowing for measurement uncertainties, the laboratory can certify frequency standards to better than two parts in 10^{10} and can measure non-standard frequencies from 10 Hz to 1 GHz. Apart from frequency standards, the laboratory can certify frequency counters, time interval meters and the frequency characteristics of signal sources.

By using Omega or North West Cape transmissions as a reference makes it much easier to verify the day to day accuracy of the laboratories frequency standards. The superior long-term stabilities and requirements of the frequency controlling elements in these VLF stations leaves little room for error when making comparative measurements. Even laboratories with rhubidium standards still have to verify them, from time to time, that their standard is within specifications.

Associated Calibration Laboratories is currently extending its testing/measuring facilities in other areas of RF measurement. The laboratory is situated at 27 Rosella Street, Doncaster East, Vic, 3109. Phone (03) 842 8822.

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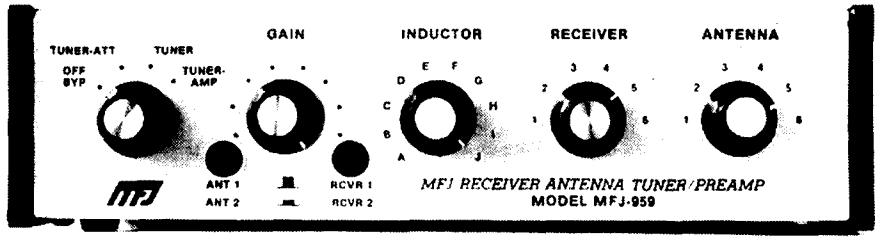

ACTIVE ANTENNA MATCHER FOR SWLs

The MFJ-959, made by MFJ Enterprises of Mississippi, USA, and distributed by GFS Electronic Imports, is designed to meet the needs of SWLs.

It incorporates an antenna matching unit which covers 1.8 to 30 MHz, a 20 dB adjustable gain preamplifier and two two-position coaxial switches, plus a mode selector.

Most shortwave listeners are faced with the problem of not being able to physically accommodate an antenna for each band they are interested in listening to. Alternatively, it is difficult to obtain a suitable broadband antenna which performs adequately.

With the MFJ-959, an SWL can now use a single random length of wire, which may be of any length that best suits the SWL's real estate, and still obtain dipole-plus performance over all shortwave bands. Users have reported up to seven S-points Improvement over using just wire on its own.

The MFJ-959 can provide this performance because it electrically matches the antenna to 50 ohms, at the frequency of operation, then introduces 20 dB of gain at 50 ohms to the receiver.

Other facilities on the unit are the twin coaxial switches, designed to allow the user to select between two different positions. It also incorporates an additional front panel coaxial switch which allows the 959 to be by-passed completely, the tuner or matcher section only to be used, the matcher used with the preamplifier and, if necessary, 20 dB of attenuation to be inserted. Power requirements are nine to 18 volts DC. All input and output connectors are rear panel mounted and duplicated in both SO-239s or RCA types.

The price of the MFJ-959 is 388 plus $18 freight. There is also a nine volt AC adaptor which can be used to power the unit for $35.

For further information please contact GFS Electronics, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

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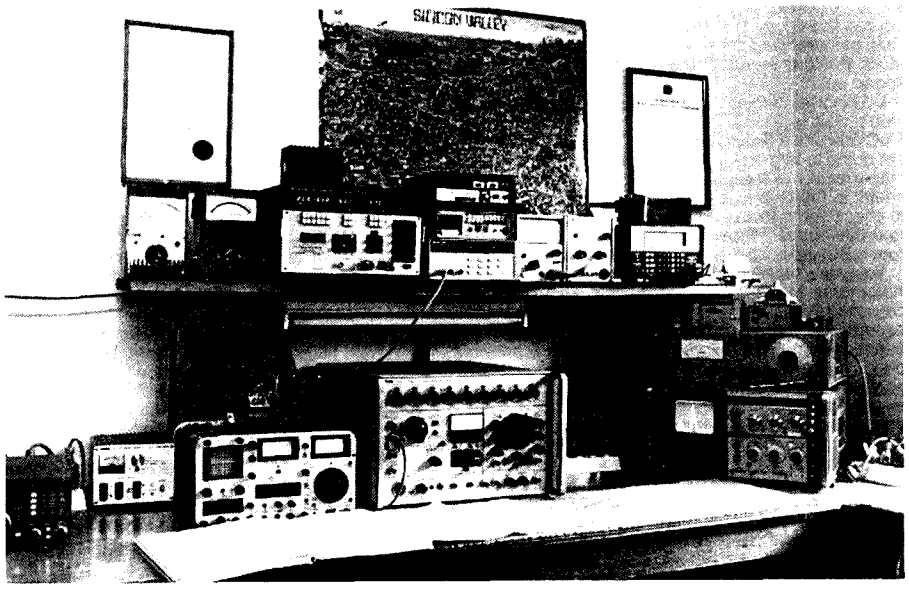


MURPHY'S COMPONENT LAW

All electronic components are filled with smoke — when it gets out the component is no good.

JINDALEE EXPANSION SUGGESTED

The Dibb Report on Australia's Defence Force capabilities calls for two more Over the Horizon Jindalee Radars.

The first such radar is undergoing operational trials near Alice Springs. Two more should be operational by the early 1990s and five such radars could possibly be justified to provide a more comprehensive surveillance cover.

DIGITISED METEOR SCATTER

A United States defence contractor has developed a system which combines digitised speech and meteor scatter. It claims the system could work even after a nuclear weapons exchange disrupted normal communications which relied on ionospheric propagation, and is immune to jamming or interception.

A demonstration showed the ability to send a one-way voice signal beyond the horizon by refracting the signal off ionised meteor trails.

Meteor scatter communication was first explored in the 1950s for non-voice data transmissions.

As many as 200 million meteors hit the Earth's atmosphere every day leaving ionised trails usually lasting between a few hundred milliseconds and two seconds.

The experiment used greatly compressed digitised voice signals in bursts, and the voice was synthesised at the receiving end using a computer.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

COMING EVENTS

The next Divisional Seminar will be held on Saturday, September 13, at Amateur Radio House. Starting time will be 10 am. There are four speakers.

The Divisional Broadcasts will have further details.

Following the success of the Anniversary Dinner there will be another one held on Saturday, October 11, at last years venue. Bookings should be made through the Divisional Office. Office hours are from 11 am to 2 pm weekdays, phone (02) 689 2417.

A reminder that JOTA weekend is October 18 and 19.

The South-West Zone Field Day weekend is scheduled to be held towards the end of October in the Wagga region. More details closer to the event.

Forthcoming WICEN exercises include the Batemans Bay Car Rally on the South Coast over the weekend of September 27/28. The Outward Bound Canoe Classic will be held again this year on the Hawkesbury River during the weekend of October 18/19.

DISPOSAL ITEMS

A new list of surplus items available for purchase from the Divisional Office may be obtained if you send a SAE.

The Divisional Council receives requests from time to time to assist in the disposal of radio items in a deceased amateur's estate. What often happens is that those having to dispose of the equipment have little or no radio knowledge. Recently, the Division received a request to assist with two estates and Council has decided to list the equipment in the *Hamads* if this magazine and to ask those interested to indicate their interest by submitting tenders for same. The replies are to come back via the Divisional Office, where they will be co-ordinated and returned to the families for their consideration.

REMEMBRANCE DAY LOG

Have you sent your log in yet? It must be in Adelaide before September 26. See page 29, July AR.

CLUBS

The next conference is to be held on Sunday, November 2. Your agenda items close by September 12, at the Divisional Office. Do you still have to respond to the information on insurance? If so, please acknowledge and return your comments.

REPEATER NOTES

Oxley Region ARC is to establish a Packet (7575) Repeater and a UHF system (8525) at their VK2RPM site.

The Central Coast ARC also wish to establish a Packet Repeater and an Amateur Television system for their region.

PLEASANT FIRST SUNDAYS

Well, it is Spring and if you live in Sydney or nearby, why not set aside the first Sunday of the month for a barbeque at VK2WI? September 7, and October 5, are the next two days.

If you have not seen the Divisional station, why not pay a visit any Sunday morning between 10.30 and noon.

A new Broadcast Roster is to be prepared for the remainder of the year. If you would like to assist please advise. In particular, we need full call operators for the Sunday evenings. The larger the team the less frequent you will need to attend. Contact Dave VK2KFU, the Broadcast Officer, via Dural or the Parramatta office.

NEW MEMBERS

As welcome is extended to the following new members who were admitted during July.

N K Little, Assoc	Crows Nest
P Maynard, Assoc	Merrylands
P A Pokorny VK2CPP	Blaxland
J Richardson VK2NET	Glenbrook
R Schreiner VK2NSR	Fairfield
G J Smith VK2KSG	Merewether Heights
F G Stoddart, Assoc	Lambton North
M W Willing	Castle Hill
K J Witchard VK2PKW	South Kempsey

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

The Jubilee 150 Committee have been delighted with the number of applications for the J-150 Award. After all, it is no use having an award if no one achieves it, however, this has created a problem with the publishing of the list of achievers, we are getting so many each month that they are taking up most of this column, so to ease the situation it has been decided to publish only the first certificate awarded to each person, in future.

This includes those gained under the VI prefix (unless it is the first certificate with any call sign). For those who did it the hard way (under the original rules), or those who still want to do it that way, there is a very nice endorsement "seal" available. Here are the latest 'first- timers'.

214	VK3DVT	270	VK3DMH	315	VK6ASM
217	VK3KAV	272	L40074	318	VK3BLB
218	VK5ABN	273	ZL2-259	321	ZS5GV
221	VK5APB	276	VK7NCH	322	VK6AJZ
224	VK5NOH	278	VK3NIR	324	VK5NRB
228	VK5NVC	281	9M2DF	327	VK5NVW
229	N6JFG	282	N7HHW	328	VK5NTK
232	VK8AV	283	WA6PEZ	329	VK2XV
235	VK4VJO	284	3D2DW	330	VK4KJO
236	VK5KEM	287	VK3XKG (as SWL)	332	VK3KKD
240	W6SIV	288	WA8YTV	333	VK2ELE
241	VK5PXK	290	VK2GA	334	VK4BKW
242	VK5BRS	291	VK2FIE	336	KA6KKN
243	VK5FS	292	N7HMB	337	N6MVW
245	VK3DSC	293	K0PGU	338	SM5OOI
247	VK5TP	294	N7BHL	340	N6BUI
250	WB7QBM	295	KD0JL	341	VK2EQY
251	VK5PRM	296	HB9DAY/W4	342	VK6AMB
254	VK2CJH	297	KA7YXC	345	VK5ZJ
256	VK3CNF	298	N5ITG	346	ZL2AVA
257	VK5BY	299	VK6ED	347	VK7NAX
258	ZL2ARF	300	VK3AUM	348	VK2DEW
260	W6KNP/5	301	ZS1FW	349	VK5BHP
262	VK4NNP	302	VK5PEM		
264	VK6QQ	312	VK5UW		

SADLY MISSED

When Chris Whitehorn VK5PN, told me of the passing of Peter Barlow VK5NPC, over the phone, I was very glad that he had prefaced it with 'are you sitting down?' Chris, with his usual forethought had realised that the news would come as a shock to me, as he had heard me giving Peter a segment for the Broadcast only hours earlier, and wanted to tell me personally before I heard it over the air, for which I was grateful. By the time Chris had contacted me it had already been arranged that Graham VK5AGR, would collect the broadcast gear from Peter's home and that Chris would edit the broadcast to spare those who knew, the pain of hearing Peter's voice or references to him. Thank you to you both, and to Bill VK5AWM, who agreed to act as Courier, for the magnificent way in which you stepped into the breach.

I sincerely hope that as you are reading this, my next remarks will be quite unnecessary, but as I write it we are in urgent need of a new Broadcast Producer. Chris offered to take it on until someone else could be found, but Chris is also involved in other things, and does not want it to be for too long a period. It we do not already have someone permanent, please give it some serious thought. Chris has already offered to give all the assistance he can. If, on the other hand, we already have a volunteer but you would still like to help in some way, we are looking for relay operators on several bands, In particular, the two and 10 metre bands. Either way, Chris or I would love to hear from you.

DIARY DATES

Tuesday, September 23 — Display of Members Home Brew Equipment.
(Don't forget that there are prizes and certificates awarded for the best entries, so bring your home-brew gear along, it might be worth your while!).

ar

VK3 WIA Notes

NEW MEMBERS

The following are welcomed as members to the Victorian Division.

Brian Anderson, Margaret Baxter VK3VOJ, Kevin Hartnett VK2FUO, Peter Hercelinskyj, Samitha Jayasinghe, Grahame Kermonde, Lloyd Kermonde, Alfred Taylor, and Leslie Warren VK3BPW.

ar

QSP

WIA MEMBERSHIP STATISTICS

As at June 30, 1986, the Wireless Institute of Australia had 8225 financial members. Of these, 163 are Associates, 1047 pensioners, 136 families, 101 students and 53 life members.

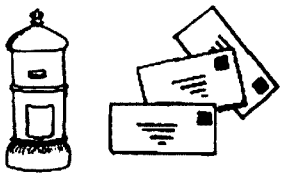
There have been 319 people who have not renewed their membership for 1986. ***Why?*** The WIA is concerned and would like to know the reasons why members do not renew.

Offset against this loss has been the recruitment of 338 new members. Not a very spectacular growth rate. When talking with fellow Australian amateurs discuss the Institute, find out if they are members, or would like to become members. If the latter, please pass the information on to your Division or the Federal Office and application forms and information on the WIA will be sent.

Many amateurs out there are just waiting to be asked to join the WIA, as they themselves are unsure how to go about it. You can assist them and yourself as well, as the greater the membership, the greater the spread of the financial burden.

Also, if other amateurs have constructive criticism of the WIA we would like to know. The WIA is not perfect, but it officers try very hard and it is only from feedback from the members that they can be sure that they are truly representing your point of view.

Remember, the WIA only exists for radio amateurs and because of amateur radio. ***It can only be what you make it!***



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

MINT CONDITION

I would like to take this opportunity to thank the people involved for the speedier delivery of *Amateur Radio* magazine to members like myself in country areas.

The introduction of the plastic envelope ensures that the magazine always arrives in mint condition.

Thanks once again, cheers and 73.

Ian Haworth VK6IH,
792 Andover Way,
Karratha, WA. 6714.
ar

INSIDE A SEALED PLASTIC BAG

In Tasmania fell the first snow of this winter. Mount Wellington, the backdrop of Hobart, glitters with snow.

To tell you this is not the purpose of my letter. Recently, I received the latest issue of the magazine *Amateur Radio.* It was inside a sealed plastic bag with a stunning blue imprint. It is an excellent idea. The magazine stays dry in rainy weather, and it remains clean. The clear plastic cover is good publicity for the *Wireless Institute of Australia,* and it lets the public have a glimpse of a wonderful magazine.

Congratulations.

I remain with many kind regards,

Bill Perieberg L70043,
Sunrise Garden,
Fern Tree, Tas. 7101.
ar

CONTACT PLEASE

We are interested in corresponding with one or two amateurs who are interested in two metres VHF, with particular interest in DX; eg Sporadic E, meteor scatter, aurora, etc.

We have both been licensed since August 1983, and we have spent many long days (and nights) monitoring for DX. We enjoy the challenge of working long distances on VHF.

One day, when monitoring the band for Sporadic E we were discussing the theory behind this mode of propagation. After reading one or two articles on the subject, it occurred to us that all the information we had available was centred around Western Europe. It was this realisation which brought about this letter.

We are intrigued to know about Aurora Australis and learn how it compares to Aurora Borealis.

We would be most happy to send information about VHF in the Northern Hemisphere in exchange for Southern Hemisphere information, possibly on a pentriend type relationship.

Your faithfully,

Linda and Phil Stubbs G6WYY and G6WYZ,
28 Permayne,
New Bradwell,
Milton Keynes,
MK13 0DG,
England.
ar

The following letter was written to the NZART magazine *Break In* in response to recent correspondence. Since Ian is referring just as much to the WIA as the NZART in his comments, it is appropriate that it should also be published in *Amateur Radio.* —Ed.

FURTHER THE CAUSE OF AMATEUR RADIO

I have read with interest the comments by correspondents in your magazine regarding the *DXpedition Paper* presented at the IARU Region 3 Conference, particularly those from ZL1s CN and AMN.

It is interesting to see discussion developed and to read considered comment by amateur radio operators. I feel that open discussion of many aspects of amateur radio in this manner is always of benefit.

I was however rather perturbed to read a letter published in a commercial amateur radio magazine here in Australia written by an ex-member of your association, namely ZL4MB. In his letter, Mr Andrews criticises variously both the NZART and the WIA.

Might I please point out to Mr Andrews, and to any others who may be of like mind, that both NZART and the WIA exist to further the cause of amateur radio on both a national and international basis. In doing so, they are also of benefit to both members and non-members alike.

Without strong representation to government and in international forums by such national organisations (and this includes overseas bodies such as ARRL, RSGB, JARL, DARC and a host of other national societies) the situation of amateur radio operators world-wide would indeed be much worse than it is. These organisations also join together through the IARU to co-ordinate many aspects of amateur radio for the betterment of the hobby.

The WIA certainly cannot claim to represent *all* amateur radio operators and I doubt that NZART does either. It is a fact, however, that the WIA is the only organisation officially acknowledged by the Australian Government as representing our fraternity. Furthermore, back in 1910, the WIA came into being as a result of a request from the Post Master General for an organisation to be formed to represent the interests of the amateur radio operators of that day, to the government.

Since then, the Australian Government has readily referred to the WIA for advice and representation in amateur radio matters. An official arrangement exists whereby this representation continues. I would assume that the NZART is in a similar situation.

Let those who wish to, stay outside the national bodies. There is no compulsion on them to join. However, those who are truly interested in the good of amateur radio would surely wish to be represented by joining their own national organisation. In this manner they can do their bit to advance the causes of the hobby by voting, expressing their opinions and exerting their influence in such a manner as to put right any wrongs where they may exist, or see that the correct path continues to be followed where such is already the course.

Let those who are not within the membership of the various organisations accept their situation whilst realising that they are not in a moral position where they can blithely criticise the actions and functions of a body to which they do not belong. This is a fact which many such persons do not seem to be willing to face.

Incidentally, I would not expect that the relatively short period of four months as a branch councillor would qualify Mr Andrews, or anyone else for that matter, as an expert on the affairs of the NZART.

This letter represents my personal opinion and should not be construed as voicing the official position of the WIA.

Yours sincerely,

Ian Hunt VK5QX,
8 Dexter Drive,
Salisbury, SA. 5109.
ar

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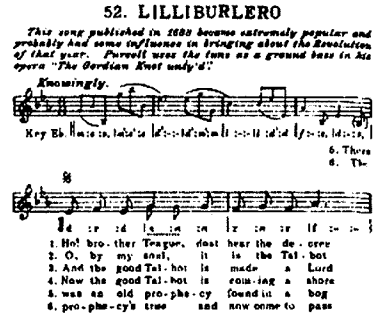
52. LILLIBURLERO

This song published in 1688 became extremely popular and probably had some influence in bringing about the Revolution of that year. Purcell wrote the tune as a ground bass in his opera "The Gordian Knot unty'd".



FUTURE SHOCK?

The contribution by Alan VK4SS, in the July AR, *Prophecy from the Past* (p 20), was fascinating to read — and as I read it, my flesh began to creep and the hairs on the back of my head (about all that is left now — the top is desert) began to rise as a static charge of horror built up on my person. The word "uncanny" is hackneyed, but it perfectly describes this prophecy.

We are now halfway in time to 2036, and the prophecy is more than half fulfilled. We have the black boxes, the push-buttons, the printouts, and the equipment which is too complicated for the operator to fix if it goes wrong. Even the "1000 kW" of ERP is not so fanciful with maximum power driving a high gain array. As Alan says, "sealed" equipment has been proposed — it was a reality in Australia in 1923.

Even the concealed antenna system may come to pass; amateurs all over the world are fighting for their existence against local-government bureaucrats who must needs flaunt their brief authority by refusing permission to put up towers, unethically using thousands of dollars of ratepayers' money (as in VK5 recently) to fight us in the courts when we dared to question their right to ban a reasonable structure. The horrifying story from VK6 (p 59) speaks for itself.

Another straw in the wind on p 49 is *Morse Code Man.* Mr Jack Sykes is "believed to be the only remaining British manufacturer of Morse keys." Well, I've got mine safely stored against the day when I can drop the Z from my call, and it's a solid, pre-war one (WWI, not WWII) so it should see me out.

From out own resources, what about putting into effect the excellent suggestion of Robert VK3XZ (p 62), to *Preserve Amateur Techniques*?

And another. In *Intruder Watch* (p 43) Bill refers to jamming and such intruders as Radio Tirana. These problems have increased in recent years and will continue as irresponsible banana republics proliferate, and dictatorships become more powerful and immune to pressure from responsible nations. We can't do much about it except keep up the good work of *Intruder Watch.*

On p 40 (*Spotlight of SWLing*) appears a trivial item, but its significance, out of all proportion to its impact, should not be missed. Since February 1944, the BBC has used *Lilliburlero* (not Lily Bolero, Robin! She was one of the Spanish Boleros) as the news theme in the World Service. It was distinctive and recognisable — in fact, unique. Listeners around the world loved it.

The tune is as old as the hills and its deletion on the flimsy pretext that it has political connotations in Ulster is blatant censorship. Those "skeletons fighting the skeletons of the past" on both sides in Ulster have no relevance to the integrity of one of the longest-established and most impartial news services in the world.

What has *Lillburlero* to do with amateur radio? Simply this: the subversive media manipulators and social controllers who appear to be infiltrating the BBC also have their sights on the control of all forms of communication. Those "sealed rigs" and programmed QSOs may be closer than 2036.

Perhaps we should take another look at packet radio.

As someone said, the price of liberty is eternal vigilance.

Yours faithfully,

Peter Thomas VK5ZPT,
Thomas Hill Road,
McLaren Flat, SA. 5171.
ar

GEIGER COUNTER

In reply to the letter from VK6OF in July requesting information on a Geiger counter, I have written to the writer directly, but would address some comments to other readers also.

Unfortunately, this type of Geiger-Muller counter would not be able to detect, still less to quantify, the fallout from Chernobyl when it arrives. That will require sophisticated low-level counting tech-

niques; specifically, concentration (ashing of solids and evaporation or filtration of liquids) and counting in a lead castle with digital scalers. Even when a total count is obtained, interpretation of its biological significance will require gamma-spectrometry to determine the mix of isotopes represented.

Remember that Chernobyl, while very large for a peacetime accident, was small in comparison with the world's atmospheric weapons testing of the 1950s and early 60s, which required such techniques to trace the stratospheric trans-equatorial fallout. Even in Western Europe the tropospheric fallout would be hard to detect with an unshielded G-M counter of the sort that an amateur could build, or afford to buy.

73,

Jim Lloyd VK1JL,
18 Pera Place,
Red Hill, ACT. 2603.
ar

DISCUSSION PAPER

I would like to present my personal views to the Discussion Paper, February AR.

I agree that new members to the amateur radio fraternity could be attracted from the existing computer hobbyist groups, however, I do not support a reduction in licensing standards.

My suggestions for a Digital Licence (HF) would be:

Novice Level — as for the present novice regulations and CW, but for theory, delete questions on speech transmission and insert questions on digital transmissions. This would allow successful candidates to operate CW and Digital Transmissions in designated portions of the Novice Bands.

For a Digital Licence I would suggest:

Limited Level — as for the present limited regulations and theory, delete questions on speech transmission and insert questions on digital transmission. This would allow successful candidates to operate digital transmission in the designated portions of VHF and above.

Present holders of Novice licenses should be granted Digital Transmission privileges.

The present examination papers for Novice and Limited could be structured to allow for candidates to sit:

a) Novice
b) (HF) Digital
c) A combination of a) and b) and
d) (VHF) Digital

I look forward to reading further views on the Discussion Paper in AR.

73,

Rod Adams VK3CBO,
c/- Post Office,
Klewa, Vic. 3691.
ar

DISCUSSION PAPER

I wish to comment on the recently published Linton/Harrison Paper on future trends, and also to present an alternative plan.

It seems to me that the idea of introducing a lower entry level than the present novice examination, to encourage operator only activities, is a serious mistake. The CB experience in the late-70s bears this out. As soon as the novelty of using their "radio-telephones" wore off, and in the absence of the knowledge to experiment, boredom led many to irresponsible on-air behaviour.

I feel a better idea would be to allow novices the use of the whole 10 metre and 70 cm bands, (where there is large bandwidth available) for the purpose of operating AM or CW equipment which they home-brew themselves. (No "black-boxes" to be allowed at all). Specialised segments in use for beacons, repeaters and amateur television, etc would have to be excluded, of course. The reason for suggesting AM instead of SSB or FM is to keep the price low, the equipment easy to build, and to ensure success in tuning and on-air operation.

A modified examination, to test their competence to build and operate such equipment would be required. Theoretical knowledge soon follows experience, thus encouraging attempts to pass the Limited/AOCP examinations (in its present form — including Morse code).

The novice five words-per-minute could also be retained.

I can imagine all the electronic magazines responding with constructional articles for AM-receivers and transmitters, and not only novices building them. Hence, home-brewing would foster the interchange of technical information between all three grades of licensees (on 70 cm), as well as encouraging the sort of experimentation which is rare these days. Both activities were the original reasons licenses were issued and surely would attract more people to the hobby.

There is a big resurgence of interest in the less complex world of the 1930 to 1950 era in cars, aircraft, model aircraft, etc, and that is also what this suggestion represents. Although regressing to an old-fashioned mode, novices would gain the thrill of using simple, cheap, home-built equipment, which they could repair or modify themselves.

That must be better than the present system, where many (most?) candidates give answers (learned "parrot fashion") to barely understood multi-choice theory questions, which are largely irrelevant to using the "black-box" transceiver, which they will inevitably be attracted to buy and use on air.

Regards,

Geoff Barron VK2AZT,
6 John Street,
Cootamundra, NSW. 2590.
ar

SPREAD THE WORD

On page 34 of AR July 1986, there is a heading *Spread the Word* asking for ideas to help other amateurs. I think this is an idea which could be enlarged even more.

As a recent devotee to the hobby (approximately six years), I find there are many things I require answers to which are not available in books at libraries, etc.

In this respect I wonder why AR has not devoted space to a section of our excellent magazine to a question and answer session.

As this would no doubt entail an extra duty to our overworked volunteer group in compiling AR the queries could be printed as for *Over to You* letters and readers invited to contact the questionnaire direct.

Just as a response to *Spread the Word* I needed to replace the ear pads on my headphones (the small ones) and found, on inquiring at the local foam material retailer, that the best way to cut foam is to use the household electric carving knife. It cuts foam very neatly and is a lot cheaper than purchasing them, particularly when they are not always obtainable (the ear pads, that is).

Two type of questions I would like to ask is:

What causes my power supply zener diode and fuse to blow out? It is regularly used to power a two metre 25 watt transceiver. The supply is rated for 6-8 amps.

Why is it necessary to have, in an ATU, a variable capacitor in series as well as in parallel?

These type of queries would be of interest to me as a newcomer to the radio hobby and maybe others as well.

Yours truly,

R Davey VK6ARD,
12 Lillian Street,
Cottesloe, WA. 6011.

Thank you for participating and contributing to AR, OM. As you will find elsewhere in this issue, beginning this month, a new column entitled Technical Mailbox. One of the Technical Editors felt there was a need for this type of column within the magazine and you have confirmed it. Your questions will be passed on to him for a reply next month.
ar

HOME BREW COST TO RISE

On July 1, a 20 percent sales tax on tube and hollow square- section aluminium came into force. Many of us use the former to make elements in home-brew antennas and a few use the latter for booms. However, the tax does not apply to extruded or drawn aluminium products in "T", "L" or squared "U" shapes.

Whoever devised the new impost must have had amateurs in mind!

Ken Gott VK3NJU,
38A Lansdowne Road,
St Kilda, Vic. 3183.
ar

QSP

CHIP DRAWS SINUSOIDAL LINE CURRENT

The TDA 4814 IC contains the circuitry for a switched mode power supply with sinusoidal line-current consumption. Sinusoidal line current is drawn from the supply network in particular when there is high power consumption.

One possible application is in electronic ballasts for fluorescent lamps, especially when a large number of these lamps are connected on one supply point.

This IC is additionally suitable for general driving of switched mode power supplies including energy supply, welding equipment, battery chargers and motor control.

The active harmonics filter consists of a rectifier arrangement in a bridge circuit followed by an up-converter.

Through a controller action it is possible to draw a virtually sinusoidal current from the single-phase line and produce a regulated DC voltage at the output.

In the case of an SMPS with conventional line rectification it is possible to achieve a power factor (ratio of active power to apparent power) of 0.5 to 0.7.

The active harmonics filter serves for improving the power factor which reaches a value of almost one, and for reducing the load on the line produced by the harmonics.

The losses caused by the active harmonics filter are more than compensated by the fact that a subsequent converter can constantly be operated at an optimal operating point because of the input control of the operating voltage.

The extra effort that is necessary, compared to an SMPS without an active harmonics filter, is made good upwards of about 500W by savings elsewhere; eg smaller smoothing capacitance and transistors of a higher resistance in the SMPS.

The IC is a standard 14 pin dual in line package.

From *Electronics News*, July 1986

DOLLARS AND dBs

How many times have you heard an amateur refer to something costing say *50 dB* when talking about some simple accessory?

Assuming that this particular *dB* is referenced to one dollar; ie *dB$*, it would appear that this purchase was on the order of $100 000! I do not know about other QTHs, but in Sydney this would buy a reasonable house! Perhaps there is some confusion in the amateur ranks as to exactly what the *dB$* refers to, so this little table should clear up the mystery somewhat.

COST	
$	dB$
1	0
5	7
10	10
15	12
20	13
30	15
40	16
50	17
100	20
200	23
500	27
1000	30
10 000	40
100 000	50

All calculations are rounded off to the nearest integer. Figures of *dB$* for values of $ that are not shown can easily be interpolated, or looked up in any table of logarithms.

So if you really mean *dB$* when you say *dB*, the above table will prove invaluable.

Contributed by David Horsfall VK2KFU

Silent Keys

It is with deep regret we record the passing of —

MR P BARLOW	VK5NPC
MR C M BAMPTON	VK2CMB
MR J HARGREAVES	VK2DUL
MR A L STEHN	VK4IS

Obituaries

JIM BOISSETT VK2ETU (VK2NBY)

Jim passed away on May 13, 1986.

Jim was known to many as *Radar*, possibly due to his training during WWII as a Radar Technician. This gave Jim a grounding in electronics.

He was a foundation member of the Western Suburbs Radio Club, and held the position of President for some time.

He will be sadly missed within the Club and by his many amateur friends.

Rex Morgan VK2PEX
ar

PETER BARLOW VK5NPC

Amateurs and shortwave listeners around the world will be saddened to hear of the passing of Peter Barlow VK5NPC on June 26, 1986.

Peter was an optimistic character who revelled in new challenges to test his capabilities. For over a year now, Peter has been producing the WIA Sunday Morning Broadcasts in South Australia and as the 'front-man' for the WIA, he dedicated a lot of time each week to making sure that every program was a good one and he continued to exhort us at the end of each program by saying *what ever you do, be good at it* a creed by which Peter obviously lived his life. He rose to the very top management in his chosen field and was known throughout the business world as a great competitor. In fact, Peter had many competitors but no enemies.

He was known as a man of tact and diplomacy but also, he was never afraid to speak his mind when he felt it was needed. He had a youthful enthusiasm for life which belied his 66 years, but he was also available with encouragement and mature advice when needed. Peter was a man whose word could be trusted.

It was a great tribute to Peter, that at his funeral service the chapel was crowded with some 120 or so of his friends paying their last respects and of that crowd, at least 20 were amateurs.

I am sure that all members of the amateur fraternity will join me in extending our sincere sympathy to Peter's wife Joan, to their son Grant and to other members of his family, and I know, that many of you, like me, will always be proud and honoured to be known as a friend of Peter Barlow.

Chris Whitehorn VK5PN
ar

CYRIL RENTON VK4CR

All who were fortunate to know Cyril were saddened to learn of his passing on June 22. Cyril was a quiet and gentle person and was highly respected by those who knew him.

He was a wonderful husband to Maynie, a devoted father to his three sons and one daughter, and a loving father-in-law, grandfather and great- grandfather.

Cyril entered the Queensland Railway Department as a fitter when a young man, but with his knowledge and capability, soon rose to be a principal designing engineer. He retired from the Railways in 1965. His hobby was amateur radio and fellow amateurs will recall his goodwill and gentlemanly manner. He will be missed by his many friends and particularly those whom he met on the amateur bands over many years.

Cyril was a life member of the Ipswich and District Radio Club.

He had that wonderful satisfaction that many would be proud of, in that two of his sons, Alan VK7RE and Peter VK4PV and his daughter-in-law, Anne VK4MUM, are amateurs that can carry on the great tradition of amateur radio.

Cyril and Maynie recently celebrated their Diamond Wedding — a most memorable and enjoyable occasion.

Deepest sympathy is extended to Cyril's family.

Norman Hart VK4KO
ar

DON WILSON VK2AES

The strains of *The Teddy Bears' Picnic* heralded to many a pre-war medium-wave listener that another relaxing Sunday morning session of records from Teralba was about to begin.

The call of VK2AES, on SSB in recent years meant a chance for a pleasant QSO to local and DX calls alike. Both now are only memories as Don Wilson passed away on June 6, following a brief, but overwhelming illness that even his strong spirit could not overcome.

Born in 1913 in West Wallsend, one of a family of seven, Don Davidson Wilson was brought up in the staunch traditions of the coal mines, which gave the area its wealth and jobs. Like so many more young men of that era, he became a miner when he left school, but this career was shortened by an accident when, at 19 he lost a leg on the rope-way at the pit bottom.

It could have been this accident that spurred him on to study for a position away from the heavy manual work. So with radio in its infancy he took the challenge and made the grade. He soon gained technical qualifications which would assure him of stable employment.

Don married Lillian in 1935, and the couple settled in the then thriving mining village of Teralba. Their house in Blair Street was to be his home until his untimely death.

Don was licensed in 1936 as VK2AES, and he became interested in DX as well as local broadcasting.

His studies took him through to the Broadcast Operator's Licence in 1940. When his equipment was confiscated and his licence suspended because of the state of emergency declared shortly afterwards, Don was shocked. This was the turning point in his career and he did not become really active again until much later.

His radio and electrical business in nearby Boolaroo took up most of his time and he had been in the same shop for 34 years when he retired in 1977. Don was active in many local organisations. He held an executive position in the Boolaroo Bowling Club and he was a keen fisherman. The packed chapel at his funeral showed just how much he was respected in the local community.

Don is survived by his wife Lillian, and children Joan, Don, John and their families. As well, he leaves a big circle of radio amateur friends at Westlakes Club and worldwide. He will be sadly missed by all.

Keith Howard VK2AKX
ar

CHANGE OF LANDMARK LOCATION

ACE Radio, who have traded in Victoria Road, Marrickville, since 1934, *have been sold*. The new owners re-located the business to Manly Vale in July.

RANDOM MORSE — COMMODORE 64

Many new computer owners may find it difficult to modify computer programs.

Neil Cornish VK2KCN
56 Sherwin Avenue, Castle Hill, NSW. 2154

John Wickham's Random Morse program for the Vic-20 computer (AR May 1986), was very good, however many new computer owners will find that it is not "easy to modify for other computers." Also, not being able to vary the speed of the CW will be a problem for those actually trying to use the program to "brush up on their CW." With this in mind, I offer this program written for the Commodore 64, which is similar in it's aims of generating Random Morse, but allows variations in the speed.

When RUN, the program randomly generates 250 characters which is the approximate length of the 10 WPM DOC test. For the novice test, which is about 125 characters, alter the 250 in line 270.

The 250 characters are split up into groups of from two to eight characters to better simulate actual words and this process takes some 15 seconds after which the operator is asked to input the speed in WPM. A default of 10 WPM may be selected by simply pressing ***RETURN***.

The computer then pauses until the operator is ready to receive the CW and while the CW is being sent, the screen blanks so that cheating is not possible. When sending is complete, the characters appear on the screen for checking.

This program is adapted from my full Morse Trainer Program which was published in *Amateur Radio* in September 1985. This program features sending and receiving of plain text, random characters, variable spacing, etc.

ar

```
100 REM RANDOM MORSE 64, NEIL CORNISH VK2KCN
110 DIMA$(36),B$(36),C$(100),D$(100)
120 A$="0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ"
130 DATA33333,13333,11333,11133,11113
140 DATA11111,31111,33111,33311,33331
150 DATA13,3111,3131,311,1,1131,331,1111
160 DATA11,1333,213,1311,33,31,333,1331,3313
170 DATA313,111,3,113,1113,133,3113,3133,3113
180 FORT=1TO36:A$(T)=MID$(A$,T,1)
190 READB$(T):NEXTT
200 PRINT"INITIALISING"
210 Q=INT(RND(0)*6)+2
220 FORT=1TO9
230 L=INT(RND(0)*36)+1:A=A+1
240 C$(C)=C$(C)+A$(L)
250 D$(C)=D$(C)+B$(L)+"2"
260 NEXTT:C=C+1
270 IFA<250THEN210
280 INPUT"SPEED WPM    10";P:P=500/P
290 PRINT"PRESS [SHIFT] FOR CW !":WAIT653,1
300 POKE53265,PEEK(53265)AND239
310 PRINT"W":FORT=1TOC:PRINTC$(T):NEXTT
320 GOSUB340:POKE53265,PEEK(53265)OR16
330 FORT=STOS+24:POKET,0:NEXTT:END
340 GOSUB430:FORX=1TOC
350 FORY=1TOLEN(D$(X)):Y.1:R=VAL(MID$(D$(X),Y,1)):IFR=2THEN500
370 GOSUB470
380 FORZ=1TOP:NEXTZ
390 NEXTY
400 FORZ=1TO7*P:NEXTZ
410 NEXTX
420 RETURN
430 S=54273
440 POKES+5,0:POKES+6,240:POKES+1,47
450 POKES,100:POKES+3,3:POKES+2,0
460 POKES+21,200:POKES+22,50:RETURN
470 POKES+4,65:POKES+24,47
480 FORT=1TOR:NEXTT
490 POKES+4,64:RETURN
500 FORZ=1TOP:NEXTZ:GOTO390
READY.
```


Solar Geophysical Summary — MAY

Solar activity was low in May, except on the fourth, when there was a single M-class flare around 0939 UTC. During the second half of the month, a region on the sun appeared likely to produce energetic flares, but none eventuated. The growth of this region was associated with a rise in the 10 cm flux value which peaked at 79 on the 25th. The region soon decayed and the flux returned to low levels. The monthly flux average was the lowest since September 1985.

The 10 cm readings for the month were:
1=71, 2,3=73, 4,5=70, 6,7=69, 8=68, 9=69, 10,11=70, 12=69, 13,14=70, 15=71, 16=73, 17=74, 18,19=77, 20=78, 21-23=77, 24=78, 25=79, 26=75, 27=73, 28,29=72, 30,31=71. Average was 72.7 and the Sunspot Average was 13.1.

The running yearly average was 17.0 at November 1985.

Sunspot averages over the past 12 months were:
5/85=27.4, 6/85=24.2, 7/85=30.8, 8/85=10.4, 9/85=3.9, 10/85=18.5, 11/85=16.6, 12/85=17.2, 1/86=23, 2/86=23.6, 3/86=15.7, 4/86=20.4, 5/86=13.1; with the yearly average being 5/85=17.8, 6/85=17.5, 7/85=16.9, 8/85=16.6, 9/85=17.1, 10/85=17.4, 11/85=17.0.

GEOMAGNETIC

May was another quiet month with the exception of the extended disturbance at the start of the month. The first part of this disturbance appears to have been associated with the disappearance of a solar filament several days earlier — the second part was associated with the passage over the solar disk of a coronal hole.

May 2-7

The geomagnetic field became disturbed at around 1000 UTC on the second and was at storm levels until 0900 UTC on the third. Following a period of unsettled to active conditions on the fourth and fifth, the field again reached storm levels after 0600 UTC on the sixth. This disturbance lasted until 0800 UTC on the seventh after which the field was generally unsettled.
A=29, 40, 18, 16, 39, 14.

May 31

The field was at storm levels with periods of minor storm conditions.
A=18.

From data supplied by the Department of Science, IPS Radio and Space Services — May 1986.

ar

QSP

SOMETHING FOR THOSE WHO HOMEBREW & DO NOT HOMEBREW

This is not a contradiction in terms, or a *Clayton's joke*. This article is for those who homebrew (build or experiment) and do not homebrew (make their own moonshine.

According to the May 1986 edition of *Elements* some 75 to 80 percent of up-market Australian wines use a foil wine cap consisting of tin and lead (just like solder — now you can start to see the association). The ingots of lead alloy are placed, like a thick sandwich or pastry, between two strips of tin and rolled together under pressure.

Because of the qualities of both metals, this is enough to form a strong and lasting bond.

Now that you are pointed in the right direction, it is up to some enterprising amateur (who can convince his YF/YL that large purchases of wine are required for his radio experiments) to find a way of using old wine caps as a solder substitute!
Good Luck!

DEADLINE

All copy for inclusion in the November 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 22nd September 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non- members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x 220mm SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. (No inquiries at office ... 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — ACT

MONOBANDER YAGI: or tribander Yagi for 20 metres. Keith VK1KG. Ph:(062) 31 7438.

WANTED — NSW

ICOM 720A, 730, 735, 740, 745 HF TCVR: & power supply. Prices to Ph:(049) 77 1507 evenings.

TRIBANDER HY-GAIN TH5, 6: TET HB34D or similar. Paul VK2AUL. Ph:(02) 528 9490.

YAESU SYNTHESISED SCANNING EXTERNAL VFO: FV-901 DM with all cables & manual to integrate with Yaesu FT-901D. Mint to very fine condition. John VK2AEW, QTHR.

WANTED — VIC

CIRCUIT DIAGRAM: lor 10 & 15 metre preamp for use with Icom 720A. Will pay costs, reverse charge call. Ash VK3NAB. Ph:(051) 22 1903.

HELP WANTED: to align VZ200 RTTY de-coder. Equipment required. Frequency counter, audio generator, & CRO. Dave L30546. Ph:(03) 688 5852 BH or (03) 232 7492 AH.

MOBILE MOUNTING BRACKET: for Icom 22S. Len VK3DCF, QTHR. Ph:(060) 71 0275 after 7 pm.

VALVE: 4/250, 4/400 or QB3.5/750 or similar. VK2BGZ, QTHR. Ph:(02) 559 5508.

YAESU POWER SUPPLY: type FP107E, complete with instruction book. Yaesu tcvr, type FT101-FT101E or FT101EE. VK3LS, QTHR. Ph:(03) 379 3619.

WANTED — QLD

KENWOOD TS-520S: In mint condition. Also 6HG8 valve. VK4WR, QTHR. Ph:(071) 41 1315.

WANTED — SA

YAESU FC-301 ATU: to match FT-301 & FP-301. Terry VK5ACB, Box 364, Bordertown, SA. 5268. Ph:(087) 52 2714.

WANTED — TAS

YAESU SP-980 SPEAKERS: two required. Also FT1 tcvr & ATU FC901/902 coupler. VK7AN. Ph:(003) 31 7914.

EXCHANGE — SA

DIAWA CNW 417 ANTENNA TUNER: 1.9-28 MHz. Cross needles for Yaesu FC700 tuner with 8V hook up. Charlie VK5YC. Ph:(085) 258 0320.

FOR SALE — ACT

TWO-ELEMENT TRIBANDER QUAD: cast alum hub, boomless fibreglass spreaders. $120 ONO. Keith VK1KG. Ph:(062) 31 7438.

FOR SALE — NSW

DECEASED ESTATES: see VK2 Mini Bulletin Notes. The following estate items are being offered and interested parties are invited to submit written tenders to the Divisional Council, PO Box 1066, Parramatta, NSW. 2150. Closing date — September 11, 1988. GROUP A: 1 AT-230 antenna tuner. 2 TS-180S with MC-50 mic. 3 FRG-7000. 4 PS-30; SP-180 (speaker). 5 DM-81 grid dipper. 6 AVO-8 multimeter. 7 RD-300 dummy load. GROUP B: 1 TS-520 SE with mic, earphones, key. 2 Vertical multiband antenna, installed on roof, requires removal. The items being offered are located in Sydney. Submission to indicate item and price offered in each case. The usual tender terms apply. Endorse envelope "TENDERS." Separate submission for each group, but can be included in same envelope.

SWAN LINEAR AMPLIFIER: model 1500Z. Good condition. $550. VK2VF, QTHR. Ph:(02) 449 4950.

TELLUROMETER: with 2.3 GHz FM link. Tripods, dishes, qty 3. $150. Video tape .5" x 7" spools. New $5. Crystal set crystal holders, old open type. $3.50 posted. VK2ZQC, QTHR. Ph:(02) 81 2143.

TOWER: 13m, 3 section triangular free standing (some welding needed) $100. 19m, 3 section mast, winchable (no winch included) with mount drilled & ready for KR2000RC & stay bearing. $120. KR200RC. Never used, still in box, new. With 32m of 8-core control cable $650. Or the lot for $770. VK2QY. Ph:(046) 33 8175.

VALVES: large variety including QQE06/40, QQE03/12, QQE03/10, 6AM5, 6AM6, etc. Radio vibrators (V6606, AV124). 2 X VHF 50W STC base stations & associated equip. Any reasonable offers accepted. G Hayden, 25 Commissioner Street, Cooma, NSW. 2630. Ph:(0648) 2 1627.

VALVES: QQE06/40 8 off, QQE03/20 1 off. Some unused $3 each. 1 base and 6 plate connectors for same $5. VK2BGZ, QTHR. Ph:(02) 559 5508.

YAESU FT101E HF TCVR: good condition with mic, manual. $400. Trio 9R-59DS rx with manual $100. Bob VK2VMX, QTHR. Ph:(063) 51 4217.

FOR SALE — VIC

AWA 12" PORTABLE B&W TV RX: type P. $30. AWA car phone tcvr — suitable for 2 metres. Complete with manual. $30. VK3LS, QTHR. Ph:(03) 379 3619.

DRAKE 2-B RX: Q-multiplier, speaker, monitor CRO, spare valves, crystals, handbooks. $230. Full details VK3IQ. Ph:(03) 306 4040 AH.

ESTATE OF LATE VK3GY: FT227RA 2m trx fm scanning unit. $220. FL2050 2m linear amp. $200. Home-brew PS 13.6V x 10 amp reg & over- voltage cutout. $20 (or $400 the lot). FP700 power supply & speaker. New, unused. (13.6V @ 20 amps). $400 ONO. Diawa ant tuning unit, type CNW-418. $150. Fujiden lo-pass filter. 50 ohm-32 MHz. Model FD-30M. $15. Micronta SWR/PWR/FS meter. 3-30 MHz -1kW. New unused. $25. Heathkit rx, model GR78. 0.2-30 MHz -6 bands w/- bandspread. $120. 12V operated. (no batteries). W/construction manual. Valve types 803, 811, 813, 866 (2), 5R4 (2), 6DQ6 new. Best offers. Condensers 440 pF x 3 gang - 5. 440 pF x 2 gang — 4. (Suitable for ATU pi-couplers) offers. Condensers 360 pF transmitting double spaced (ex AT5 TX - 2. $10 each. 80 pF transmitting double spaced made by Transmission Equipment - 2 $5 each. For inquiries contact Ed Manifold VK3EM, QTHR. Ph:(03) 578 7745.

FT-7: 80-10m tcvr as new condition. Professionally fitted with several extras. Complete with mobile mount, mic, handbook. $375. 9.0 MHz, 2.1 kHz bandwidth, superior quality, Fox Tango Club, 8 pole, xtal filter. $65. VK3ARZ, QTHR. Ph:(03) 584 9512.

HEWLETT-PACKARD 41C: w/owners handbook. $200. 41C/41CV card reader $100. Printer w/transformer $175. Wand $75. HP-IL module $100. Memory module, quad memory module $60 ea. Time module $100. Circuit analysis, math & statistics pacs $30 ea. Relevant books & solutions $10. All perl cond. HP-15C scientific calculator w/advanced functions & owners handbooks, new. $130. HP-34C w/transformer, owners handbook & programming guide, student engineering, app maths, statistics, solving problems $200. Perfect condition. Estate Alex VK3AAP. Mona VK3BRE. Ph:(055) 62 6016.

HIDAKA 3 EL TRIBAND BEAM: with batun, new unused in original packing $200. National (USA) NCX5 200W 5 band tcvr. Solid state VFO dig-readout, PS. Manual spare valves, ex cond. $120. KW (UK) Viceroy 200 W 5 band tx. Vy stable VFO, PS, manual, spare valves. Ex cond $75. All ONO. Prefer buyer inspect & collect. Chas VK3PT, QTHR. Ph:(059) 75 2775.

PANASONIC OSCILLOSCOPE: model VP-516A. 8 cm by 10 cm screen. Y-axis, 30 mV/cm to 30 V.cm, DC to 3 MHz (-3dB), 5 MHz (-6 dB), 0.18 usec risetime. X-axis, 0.2 usec/cm to 1 sec.cm sweep, auto-trigger, internal or external. External X-axis input, DC to 300 kHz (-3 dB), sensitivity 1V p- p. Hybrid circuit, spare valves supplied. Power 240V AC, 30W. Weight 6.5 kg. Manual with circuit, operators guide & maintenance details supplied. Clean & in good working order. Two available. $125 each. Ron VK3AFW, QTHR. Ph:(03) 579 5600.

VALVES: 250 new miniature 7 & 9 pin. Many types including 10 7360. $250 the lot. VK3VF, QTHR. Ph:(059) 75 1475.

YAESU FRG7700 RX: with antenna tuner. $495. Or exchange for 2 metre hand-held. VK3RM, c/- Eliza Lodge, 347 Nepean Highway, Frankston, Vic. 3199.

FOR SALE — QLD

KENWOOD TS-520: DG5 mic & manuals. Good working order. $400 ONO. Fred VK4NMA/L40855, QTHR. Ph:(07) 396 3521.

MICROWAVE MODULES: 70 cm amplifier with circuit. $240. Kevin. Ph:(07) 377 4286 BH or (07) 201 3006 AH.

FOR SALE — SA

TS830S HF TCVR: with WARC bands & DC converter. In good condition with original packing & manuals. $850 ONO. Graham VK5YM, QTHR. Ph:(087) 25 9752.

FOR SALE — WA

KENWOOD TS120; AT120; VFO120; MB100; MC35: owners handbook & service manual for all. Orig cartons, used sparingly, mint condition. $650 complete. Century 21 rx, 0-30 MHz, solid state. Analog dial with handbook. $150. Dunkley Graham VK6AMG, QTHR. Ph:(02) 542 3208 during September only. After September phone (095) 35 2490.

FOR SALE — TAS

YAESU FT102: 230W output PEP, inc AM/FM board. Filter, narrow SSB, CW filters. New in box. Must sell. $1130 the lot. Cost $1600. VK7AN, QTHR. Ph:(003) 31 7914.

Advertiser's Index

KENWOOD

pacesetter in Amateur radio

NEW Compact 45 W 2 m

45 Affordable Watts!

TM-201B/401B

Super-compact mobile transceivers

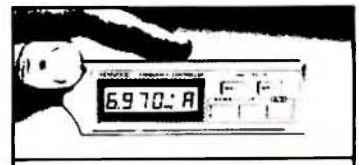
The TM-201B boasts a powerful 45 watts output, easy-to-operate front panel controls, and ultra-compact size. The GaAsFET receiver front end provides high sensitivity and wide dynamic range. Receive and transmit characteristics are tailored for minimum distortion and excellent audio quality. Both the TM-201B and the TM-401B are supplied with a high-quality external speaker, hand microphone and mounting bracket.

- 45 watt output, with HI/LO power switch (TM-401B has 25 watts output.) 5 W low
- Dual digital VFOs
- **TM-201B covers 144-148 MHz. TM-401B covers 440-450 MHz**
- 5 memories plus "COM" channel, with lithium battery back-up

- Programmable, multi-function scanning
- High quality external speaker supplied
- Audible beeper confirms operation

Optional accessories:

- PS-430 power supply
- TU-3 or TU-3A two frequency tone encoder
- FC-10 frequency controller
- MC-55 (8-pin) mobile microphone
- SP-40 compact mobile speaker
- SP-50 deluxe mobile speaker
- SW-100A/B SWR/power meters
- SW-200A/B SWR/power meters
- SWT-1 2 m antenna tuner
- SWT-2 70 cm antenna tuner
- PG-2K extra DC cable
- PG-3A DC line noise filter
- MB-201 extra mobile bracket



Optional FC-10 frequency controller

Convenient control keys for frequency UP/DOWN, MHz shift, VFO A/B, and MR (memory recall or change memory channel)

More information on the TM-201B/401B is available from authorized dealers

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

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Yen Busters!

As this issue went to press, the poor old Aussie dollar reached an all-time low. Less than 60¢ US — and worse for amateurs — less than 90 Yen.

DSE puts value back into your dollar... look at these prices. They'll never be this low again — so if you want the latest in amateur bargains, buy now and $ave

90 OFF 70!

Was $489

Save on the FT703 hand-held: everything you need is in your hands for full 430-440MHz coverage. Thumbwheel frequency selection, repeater splits, high/low power operation — and all this in a hand-held that's just 65 x 34 x 153mm. Even has full VOX with optional YH2 Headset Mic! Complete with FNB-3 battery — and this crazy price is even $100 less than the current catalog price! Cat D-3508

$399 Save $90

SB-2 PTT Switch

Use in conjunction with 703 for ptt or lock-on transmit. Cat D-3512

YH-2 HEADSET

Full VOX operation with FT203 or use with SB-2 PTT. Cat C-4200

Only $35.95

Only $49.95

FT726 TRIBANDER:

What a bargain!

Was $2120

$1799

Your very last chance to grab one of these beauties — at such a huge saving over current retail! With a fantastic reputation for solid satellite work, the 726 offers features far and away the state-of-the-art in VHF/UHF technology:

- **All modes, all three bands with 6 & 70cm modules installed.**
- **Full duplex crossbanding with satellite unit installed.**
- **240V AC operated; 12V DC with optional power cable.**

Supplied with 2 metre module installed: add the extra bands when you need them! Cat D-2950

Save $321

ALL MODE ALL SAVING FT290R

$100 Off!

The versatile FT290: all mode 2 metre transceiver that goes anywhere: It's a portable (battery operated). It's a mobile (12V DC). It's a base (mains adaptor optional). It's superb!

- **Full 144-148MHz coverage**
- **FM, CW & SSB**
- **High/Low power outputs**
- **10 memories**

Cat D-2885

Was $689 **$589**

SAVE 9000 YEN ON THE FROG!

Only $969

$100 Off!

Yaesu's superb FRG-8800: the receiver for the professional monitor, the avid SWL, or the amateur who wants real receiving power! Full 2MHz to 30MHz coverage PLUS VHF with the optional 118-174MHz converter (fully internal!) 10 memories, dual clocks... the features are endless. It's real value at this sensational saving! Cat D-2821

DC Cable:

Mobile or field operation — adapts the FGR8800 to 12V. Cat D-2822 $7.95

VHF Converter

Fully internal converter for the FRG8800. Cat D-2831

Only $65

QUICK! Charge in and save!

Yaesu NC-15 Quick Charger — suits FNB3 and FNB4 NiCads. 2 hour charger, auto cut-out: and it's also a base supply. Handy — and a handy saving! Cat D-3513

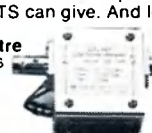
$145

Corona GaAsFET Preamps: Ideal for satellite reception!

- gain 20dB typical
- noise gain 0.8dB typical

Your choice of 2 or 70 preamps — with the performance that only GaAsFETS can give. And look at the savings!

Two Metre Cat D-2956 $79



Save $36

70 Centimetre Cat D-2955 $69

Save $20

ADVERTISING NEW OVERSEAS MODELS

Beware of adverts showing or offering new models from Japan. While some of these are available on the Japanese domestic market (ie not suitable for Australia) they are not yet available in Australia.

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Amateur Radio

Construct a **DIRECT CONVERSION RECEIVER** for 80m
1986 REMEMBRANCE DAY ADDRESS
ANTENNA ARRAYS Conclusion
AMATEUR RADIO ENGINEERING PROJECT Part 2
DESIGN of a BAND-PASS FILTER for 2m
SMALL SIGNAL BJT AMPLIFIERS

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL 54, No 10, OCTOBER 1986

Amateur & Kit Bargains

Limited quantities — not available from every store. Phone your nearest DSE store.

2m Hand-held Transceiver Yaesu FT-209R

Compact, yet one of the most sophisticated units around! • key-in frequency selection and function pad • LCD frequency and function display • memory • manual, programmable scanning with skip and priority scanning. Freq. range: 144-148MHz. Switchable hi/low power. (1.8/3W)
Cat D-3502

Power output depends on battery. Choose optional FNB-3 (2.7W) or FNB-4 (3.7W).

WHILE STOCKS LAST!

WAS $439

NOW **$399**

Save $280 on the ultimate in 2m versatility

Yaesu's FT290: go-anywhere, do-anything 2m workhorse. It's all mode (FM, SSB & CW) and it suits all users: hand-held (uses "C" size batteries), mobile (12V operated) or base (with optional 240V adaptor). Cat D-2885

Was $759

NOW **$479**

Last chance for Yaesu's mobile antenna system...

Because of the plunging Aussie $, and an increase in import duty, the cost of the Yaesu mobile antenna system has gone through the roof. So if you are even thinking about going mobile on HF, grab some of these -slashed in price to clear-while stocks last.

And if you already have the base & stub, you'll need the resonators some day. Here's your chance. But don't wait!

Note: strictly limited stock — not all parts are in all stores!

RSM-2 Gutter Mount. Deluxe gutter gripper, complete with quality co-ax and PL259 plug. Cat D-4100

Was $50.55 NOW **$29**

RSM-2 Stub. Not just the base for the resonators — it's also a quarter wave on 2m. Screws into RSM-2 mount. Cat D-4102

Was $21.95 NOW **$13**

HF Resonators: Just add on the band you want.

80m (RSL3.5) Cat D-4110 **Was $54.95 NOW $34**

40m (RSL7A) Cat D-4112 **Was $60.45 NOW $29**

20m (RSL14) Cat D-4114 **Was $60.45 NOW $29**

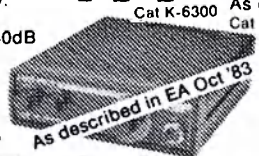
15m (RSL21) Cat D-4116 **Was $37.95 NOW $25**

10m (RSL28) Cat D-4118 **Was $37.95 NOW $24.95**

40-Ch. UHF Transceiver

Enter the exciting world of HAM radio and save $$! It's got the features and performance of 'off the rack' units — that's why it is such a great buy. • 40 channels within the 438.025 - 439MHz frequency range • Sensitivity: 0.4uV for 20dB quieting • Selectivity: -6dB 7.5kHz; -60dB 15kHz • Adjacent channel rejection: better than 80dB • Power output: 5W (typical)

JUST **$199**
Cat K-6300

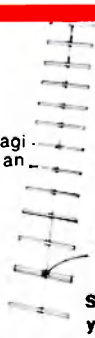


30 channel up-grade kit to suit K-6300 Cat K-6301 **$12.95**

UHF Yagi — 11dB gain

Great investment for 70cm enthusiasts. This 13-element Yagi - covers 430-440MHz band with an impressive 11dB gain.
As described in Feb '86 AEM
Cat K-6305

ONLY **$39.95**



HF Transceiver kit:

Yes, we've slashed the price on our popular HF transceiver kit. Can cover any single 500Hz segment within 2 to 30MHz (80m version supplied). Covers CW, LSB, USB modes.
As described in Oct '85 EA.
Cat K-6330

JUST **$349**

Special amateur radio club quantity discount. Just send in your official order for 5 units and save $50 per unit!

70cm GaAsFET Preamp

What performance! Get that extra performance from your UHF rig: 10dB minimum gain (typical 3dB or higher). Includes tx/rx switching with quality coax relays. Noise figure less than 2dB (1.5dB typical).
As described in May '86 EA.
Cat K-6309

$129

2m Yagi — 10dB gain

This 9-Element gets you into VHF action sooner — it's pre-drilled, so no tuning hassles. Easy to assemble... set up in no time.
Cat K-6297
As described in April '85 AEM

$89.95

Phasing Harness to stack UHF Yagis.

Get better range with two antennas — harness matches both to one feed line and boosts gain up to a whopping 15.5dB. Suits our UHF Yagi (K-6305).
As described in March '86 AEM
Cat K-6299

ONLY **$10.95**

2m GaAsFET

Into 2m? Build this one. Same outstanding performance as our 70cm version... and the same outstanding saving!
As described in June '86 EA.
Cat K-6311

JUST **$129**

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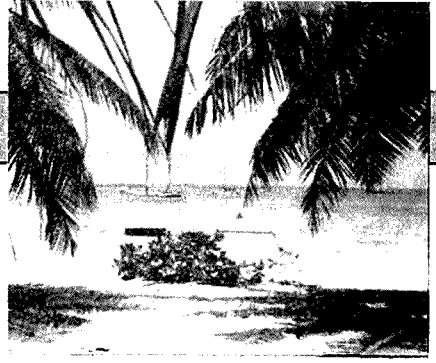

Looking from Direction Island to West Island across the lagoon on Cocos (Keeling) Islands. (See story, How's DX column).
Photograph courtesy Neil Penfold VK6NE

Amateur Radio

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Special Features

Technical Features

Regular Features

JAS-1, the Japanese Amateur Satellite was eventually successfully launched, a few days late, on August 12. In the AMSAT column this month, Colin VK5HI, gives all the technical descriptions and appropriate formulae for the operation of JAS-1. (see page 51).

And as JAS-1 soars aloft, Joe VK4AGL, takes us back to the start of the satellite generation, Sputnik One. (Page 26).

As promised last month, Drew VK3XU, presents (page 16), the full construction details and circuit diagrams and PCB design for an 80 metre Direct Conversion Receiver.

Each year, prior to the beginning of the Remembrance Day Contest, a notable personality delivers an opening speech. This year, the guest speaker was Sir Mark Oliphant, a well-known Australian. Sir Mark has held many important posts around the world including the position of Governor of South Australia. Ron VK3OM, has painstakingly transcribed Sir Mark's speech from tape and Ken VK3AH, researched and wrote a small insight into his life. (See page 28).

Peter VK3KAU, is searching for more material for another cassette tape following on from the great success of Volume 1. Peter is particularly interested in recordings of contacts on the former amateur bands, such as 112 and 288 MHz, etc. See page 57 for full information.

The International Radiosport Association is an independent international organisation dedicated to the promotion of quality and sportsmanship in amateur radio. This month they are conducting their first Championship Contest, the rules of which are published in the Contest Column. They also feature several awards. See page 48 for a description of the Association and details of some of their awards.

Interested in propagation on two metres. An article, originally from *Electron and* translated by John VK4QA, for AR, describes some interesting experiments which are being carried out in Europe. Field Aligned Irregularity uses similar reflecting or bending mediums to Sporadic E. This may be "food for thought" for the VHFer (see page 24).

Don't forget JOTA, this month. And, if you participate, a short story and some pictures would be appreciated.

B K P

DEADLINE

All copy for inclusion in the December 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 20th October 1986.

Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, by the 20th day of the second month preceding publication. **Note:** *Some months are a few days earlier due to the way the days fall. Watch the space below the index for deadline dates.* **Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

THIS MAY CONCERN YOU!

Two matters of some importance have surfaced via our mailbox in the last few weeks. The first relates to a frequently recurring problem with this magazine. Once again we have almost run out of technical articles. Not material in general; our regular columnists usually manage to put together enough about contests, satellites, DX, awards or whatever to fill their allocated space each month. But you, the readers, have always made it clear that what you want in each issue of AR is a good quota of technical information; and we all prefer it to be written by our own members rather than reprinted from overseas journals.

Unfortunately the supply has nearly dried up! The bottom of the proverbial barrel stares us in the face! (Your Editor has always had a weakness for well-mixed metaphors!) Where are all our technical authors? Probably, like the rest of us, they are so involved with making a living and keeping up with today's inescapable mass of paperwork that they don't even have time to get on the air, let alone build a new whiz-bang gizmo, *let alone* write a story about it.

Maybe though, some of you have a story to tell — and time to tell it — but just don't quite know how. A letter arrived recently from one such enthusiast. His query was "How should I prepare an article on Topic X? What form of presentation is required?". Could there be others, similarly bursting with interesting technical material, who only need a few clues to set them writing? Rather than just replying to one, it now seems a good idea to address it to you all.

First, we're not really all that fussy! We're so glad to get something we can use that we don't mind having to do an hour or two of editorial work to "lick it into shape". On the other hand, the less editing it needs the sooner you will see it in print. First, we must be able to read it. So, if possible, please type it, unless your handwriting is very very good. Please, please, double space the lines, unless you *know* your ability at technical journalism is so great that no editor could possibly want to change a single word! Those spaces are where all the editorial changes have to be written in.

It helps to keep things tidy if you use standard A4 size paper (30 x 21 cm, or for old-timers, 11½ x 8 inches approximately). Leave a good wide margin at the left, at least 3 cm. Please *don't* write it all in block capitals, either by hand or on your old teleprinter! Use upper and lower case, just as it will be printed.

If there are drawings, diagrams, circuits, board layouts etc (and without some of those it will hardly be technical!) you have two choices. If you are a skilled draftsperson you will do it yourself (on A4 sheets). If not, send us readable sketches and leave it to us.

We do like photographs. Black and white for preference, but even colour slides can be used if they are in sharp focus and have good contrast. But photocopies of all material are a no-no! They usually have little blemishes, streaks, spots or whatever, just where they will produce maximum confusion. Murphy loves photocopiers!

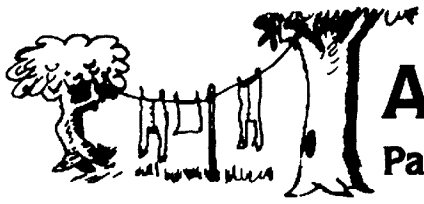
Has that triggered you off? Good. We are waiting for your first article. It might even win a Technical Award. Go to it!

Second topic. Third Party Traffic. Without pointing any fingers, various activities have become popular since third-party traffic was added to our privileges. Sometimes these involve not only our own friends and neighbours but also non-technical members of the general public. Another member wrote recently to point out that while handling unimportant non-commercial traffic for third parties is permitted, soliciting for it is NOT. We had so far seen no such prohibition in any of the new regulations, and replied to this effect. The response was a photocopy of a letter from DOC in reply to his query as to what is permissible. It states specifically "*Amateur stations are therefore not permitted to solicit for messages on behalf of the general public*". It was written some years ago, obviously after third-party was approved, but before the new Act became effective. It probably still applies. It might be best to assume that it does, until the new Amateur Handbook (still in preparation) removes all doubt. Need I say more?

A brief admission. I was wrong in July, when I wrote that television broadcasting began from the Crystal Palace 50 years ago. Only a week or two later, I found from an authoritative journal that it was the Alexandra Palace. Too late, it was in print! At least one eagle-eyed reader spotted the error. Dave VK3ZXU wrote in, not only to point out the error, but also sending some 1936 magazine items about the event. You will find them in this issue. Thanks Dave! 73

Bill Rice VK3ABP
Editor

Write an Article for AMATEUR RADIO!



ANTENNA ARRAYS

Part 3 — Installation and Use

Paul McMahon VK3DIP
47 Park Avenue, Wattle Glen, Vic. 3096

In order to help those installing this program on their system, an example of a simple three element Yagi will be considered.

The data for this example is presented below:

Number of elements = 3
Frequency of interest (MHz) = 300
ELEMENT NO 1
Diameter = 0.002, Length = 0.475
ELEMENT NO 2
Volts in = 0 , 0
Position angle = 180, Displacement = 0.1
Diameter = 0.002, Length = 0.5
Series resistance = 0
ELEMENT NO 3
Volts in = 0 , 0
Position angle = 0, Displacement = 0.15
Diameter = 0.002, Length = 0.45
Series resistance = 0

Some of these items may require further explanation. The Frequency, in this case chosen to be 300 MHz so that length in metres equals length in electrical wave-lengths, is the frequency in megahertz that the array will be analysed at.

Element number one is the reference element, it is usually the driven element in an array. In this program it will be initially assumed that this is the case, although if need be, later on using the alter option, this can be changed.

Subsequent elements to one can be driven or only parasitically excited. The way this is accomplished in this program is via the "Volts in" parameter. If, as in this example, parasitic only elements are required then their feed point voltage should be chosen to be 0 , 0.

If, for example however, an element was fed, by coaxial cable or other means, so as to be, say 90 degrees out of phase with the reference element, but at the same level, then 1 , 90 would be the appropriate response. Element two in this case is the reflector so, when its position is specified, it has an angle of 180 degrees to the reference. For this input, zero degrees is straight ahead, 180 degrees is behind, 90 degrees is above and 270 is below, with, of course, all points in between in the usual places. The displacement then in this simple case, becomes the element spacings. In more complex cases it must always be remembered that the displacement is with respect to element number one and not the next closest element.

This program also can allow for series resistance in the elements. This is useful for seeing the effect of non-ideal elements, or for other purposes which will be discussed later. In most cases, this will be zero. Element three in this case is the director and is thus located in front of the drive element.

The results from this array are given below:

Currents
Element 1 — *1 +JO*
Element 2 — *-0.284 + JO.234*
Element 3 — *-0.46 - JO.628*
Impedances
Element 1 — *9.5 - J25.7*
Element 2 — *0 + JO*
Element 3 — *0 + JO*
Gain — *7.8 dBi*
f/B — *18.2 dB*

The impedances for elements two and three are, of course, zero because they were chosen to be parasitic elements. If desired the length of element one could be changed by small amounts until its impedance was solely real; ie it was resonant. This process does, however, take quite some time as it is necessary to re-calculate the entire array after each change.

See the Appendix for more detail on intermediate values, etc.

VALIDATION OF THE PROGRAM

While, as I have said, this program for all its mathematical complexity, in only a model or approximation to the real world. It is always of some interest to compare the results obtained with those obtained experimentally or theoretically by other methods. The program as it stands will only accept up to 10 elements, though this is only limited by the dimension statement which can, of course, be changed. With this in mind, the available literature was searched to find results that could be comparable. One source was eventually chosen. While it may seem difficult to believe that only one was available it must be noted that the vast majority of amateur literature does not usually inspire with its absolute accuracy or test methods. In fact, even when dB figures are claimed for gain as being measured, it is rare that the reference is given; ie dB isotropic or dipole, etc.

The chosen work is Reference 3 (b). In this article, James Lawson gives a good comparison table when he is validating his model against the NBS* Yagi data. Part of this along with the results from the model developed here are given in Table 1. (* National Bureau of Standards (US)).

Table 1. (Partially from Reference 3 (b) with additions).

Antenna Gains in dBi

NBS Yagi Type	NBS Measured	Half Power Beamwidth	Pattern Integration	Lawson Model	This Model
2 elements	4.77	7.50	6.71	6.70	7.28
3 element	9.25	10.02	9.62	9.16	8.93
5 elements	11.35	11.86	11.41	10.73	10.33
6 elements	12.35	13.90	12.64	11.80	10.77

As can be seen there is reasonable agreement between the results obtained using this model and other methods. This is particularly gratifying when consideration is given to the assumptions and limitations of the model developed here. The worst deviation appears to be with the six element design, but even this represents only some eight percent error. This difference is probably due to the accumulation of errors, as the amount of processing goes up greater than geometrically with increasing numbers of elements. What the above does indicate however, is that the model will be useful in predicting antenna performance without or/before building it.

ASSUMPTIONS AND LIMITATIONS

It is vital for any user of this model/program to understand at least in part the limitations and assumptions on which it is based. These factors will determine where, when, and on what analysis can be done successfully.

Firstly, the array as analysed is in free space; ie not above a real ground. This means that antenna performance in a real situation that is not a considerable distance above ground, will not perform in exactly the same way as predicted by this model. This will not usually be too much of a problem as the major effects will be to raise the angle of maximum gain, plus to modify the input impedances.

Secondly, the array does not have a metallic boom or other support. Metallic structures like booms will have definite effects on performance. Lawson in Reference 3 (c) discusses this and the first limitation and shows how this can be overcome. Once again this should not greatly affect the usefulness of this program.

Thirdly, there are limitations imposed by the micro-computer and version of basic that the model is run on. Most owners of micro-computers are reasonably aware of their machines limitations in speed and accuracy.

Fourthly, the gain routines integrate in 10 degree steps, if the array being analysed has lobes much narrower than this incorrect answers will be given. It should also be noted that the fast approximate gain assumes an axis of symmetry in the antenna pattern in the zero degrees direction.

Fifthly, and most importantly, this is only a theoretical model. If great accuracy or very close to real-world answers are desired, then the only way to obtain them is by empirical methods such as those used by the NBS; ie many, many years of intensive "trial and error." Not withstanding this, it should be possible to "design" antennas using this model, and it will certainly tell you if some new idea or configuration has merit without having to build it first. It must, however, be stressed that only the final test of building an array and using it will show how successful the design is. This model will at least get the builder pretty close to the ball-park if not in a front row seat.

Finally, the limitations caused by program set-up must be allowed for. Foremost among these are the limit on number of elements; ie 10, the limit on all elements being about a half wave in length, only two dimensional arrays possible, and something that can be a real problem, the more elements in the array the longer it will take to run.

A NOTE ON MODELS

There are two basic types of models, the Empirical, and the Theoretical. Empirical models are those that have been determined after extensive experiments in actual working situations. They are formulated so as to give the actual results that have been obtained in the experiments. Theoretical models on the other hand are derived from first principles and are not linked to any particular situation. In most cases, while these two types of models will give very similar results, by definition the Empirical type will be more accurate. This is due to the need to make assumptions and simplifications in the Theoretical case.

What then is the use of a Theoretical model? The reason is simple, there only exists Empirical models for a small number of cases, and if none exists then a Theoretical model is the only option.

The model given here is of the Theoretical type. While Empirical models for Yagi antennas do exist: eg the NBS data for Yagis, they are somewhat limited in scope and can only be applied to the configurations on which they were developed. This model then, is primarily intended for those areas that have not received much experimental notice, or in perhaps more speculative areas. While the ultimate accuracy of its predictions may not be excellent, they

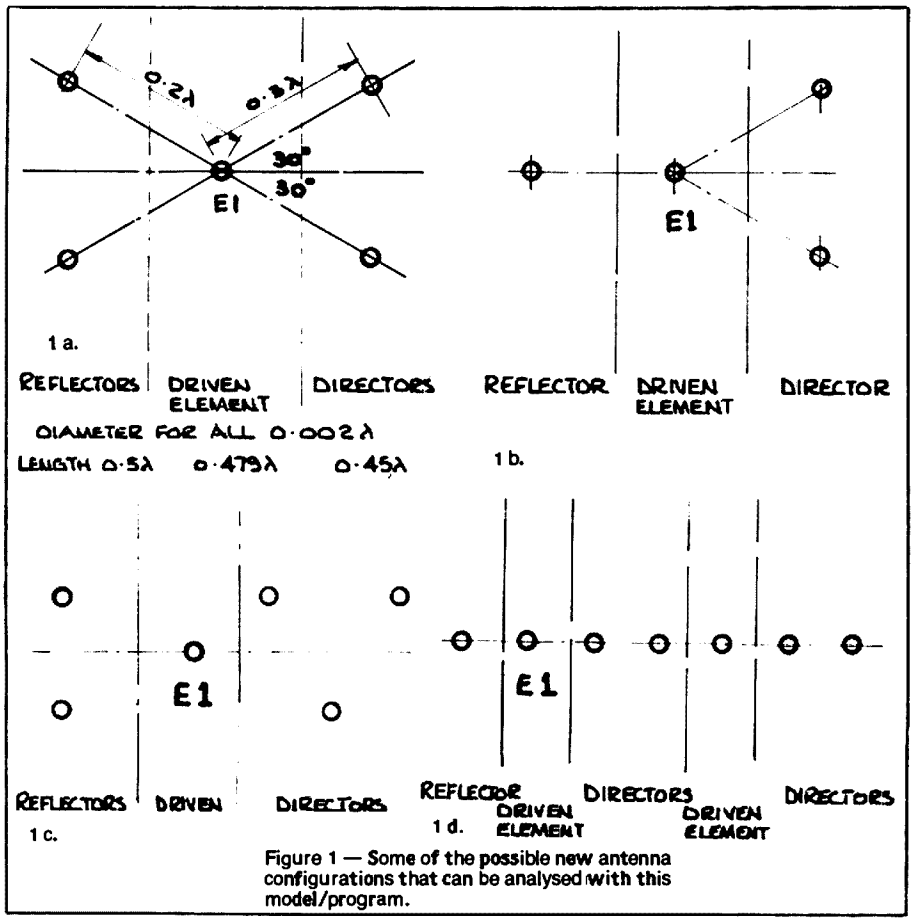


Figure 1 — Some of the possible new antenna configurations that can be analysed with this model/program.

should in all cases give a good starting point for further investigations.

NEW ARRAY TYPES

This is where this program comes into its own. You have a bright idea for a new antenna but haven't got the time to build a hundred of them to find the optimum configuration. This program will allow you to effectively do just that in a reasonably short time and for very little cost.

The number of different types of antennas are limitless, all it needs is someone to imagine them. Some examples may illustrate this.

If you take the three element antenna given as a test example at the start of this article and add a 35 ohm resistor in the reflector; ie RS = 35 ohms, then the gain goes down. This is no surprise you say; but wait. The gain goes from 7.8 to 7.3 dBi because of increased losses etc, but there are other changes as well as straight gain. If you are a fox-hunter or just someone who cares more about front-to-back then, you would be interested in the fact that the front-to-back goes from 18.2 dB to 36 dB. Furthermore, unlike similar designs that claim very high front-to-back, this figure is not very frequency sensitive. In practice, it is unlikely that exactly 35 ohms would produce this exact effect, but a value close to it should. A 100 ohm trim pot placed in the reflector and then trimmed for maximum front-to- back should however produce the desired effect. Another different configuration that could be investigated with this program might be as shown in Figure 1a.

The dimensions etc, shown in Figure 1a are not the result of a large number of iterations. Undoubtedly, if more time was spent something greater than the 9.6 dBi, that is the result for this case, could be found. This is at least of the same order as a normal five element Yagi and requires a much shorter boom. In fact, it is most similar to two stacked three element beams but without the phasing and feeding problems. Other interesting configurations are also shown in Figures 1b, c, d.

As can be seen, the possibilities abound, all that is needed is a micro- computer and some day you could have an array named after you. It is one very great advantage that amateurs have, there is a vast number of us, and quite a number have micros. The advantage that some researchers may have in access to very fast large computers is totally negated by the weight of numbers, as I stated at the start of these articles, the amateur does have a lot to offer the science of antenna theory and design. In fact, one could imagine a net where all participants have a computer with the program. Isolation of optimum dimensions could be achieved quickly if the net was co- ordinated to run a number of slightly different cases at once. The effective processing power would be quite large and very unique to the Amateur Radio Service. It might even give us something to do with packet radio besides rag-chewing — true parallel processing!

COMPLETE LIST OF REFERENCES

The following is the complete list of references used in Parts 1 to 3 of this series.

1. *Antennas* by J D Kraus, published by McGraw Hill, New York, 1950.
2. *Vertical Phased Arrays* by F Gehrke, *Ham Radio* July 1983.
3. *Yagi Antenna Design*, a series of articles by J L Lawson, *Ham Radio* 1980. The particular ones referred to are as follows:
   a) *Performance Calculations* page 22, January 1980.
   b) *Experiments Confirm Computer Analysis* page 19, February 1980.
   c) *Practical Designs* page 30, December 1980.
4. *Antenna Theory and Design* by W L Stutzman and G A Thiele, published by Jon Wiley and Sons, New York, 1981.
5. *Antenna Theory* by C A Balanis, published by Harper and Row, New York, 1982.
6. *Applied Yagi Antenna Design* by S Jaffin, *Ham Radio* May 1984.

NOTE: In addition to the three articles by James Lawson quoted above, articles also appeared in the May, June, July, September, October and November 1980 issues of *Ham Radio*.

TECHNICAL EDITORS NOTE: A copy of Paul's program was obtained and with a few minor modifications, was tested using Microsoft Basic on a Microbee (CP/M Disk version) and also on an IBM look-alike. The calculated results given above were easily duplicated. Other configurations were tested and the results agreed reasonably with other published material. Some consideration could be given to the selective use of double precision variables to improve the calculation accuracy.

APPENDIX

A. The Cosine and Sine Integrals

These routines 14000 for Cosine Integrals and 15000 for Sine Integrals can be checked for accuracy against the following table. Note that the Cosine Integral will need the constant EU assigned before it will function correctly.

XX	XC = CI(XX)	XS = SI(XX)	CI(XX)	SI(XX)
SVI 318 MICRO			KRAUS TABLES*	
0	Error	0	-	0
1	0.3376	0.9461	0.3374	0.9461
2	0.4230	1.6054	0.4230	1.6054
3	0.1196	1.8487	0.1196	1.8487
4	-0.1410	1.7582	-0.1410	1.7582
5	-0.1900	1.5499	-0.1900	1.5499
10	-0.0455	1.6583	-0.0455	1.6584
15	0.0463	1.6182	0.0463	1.6182
20	0.0444	1.5482	0.0444	1.5482

* Reference 1.

B. The Intermediate Z Matrix for the Three Element Example (Variable A)

(62.69, — 4.64) (67.33, 7.54) (60.43, — 7.10)
(67.33, 7.54) (73.13, 42.54) (40.79, — 28.35)
(60.43, — 7.10) (40.79, — 28.35) (53.00, — 49.49)

C. Variable List

— NE = Number of elements in array
— A (NE,NE), B(NE*2+1, NE*2 +1), X (NE*2), I2(NE* 2)
= Intermediate matrices used in simultaneous equations.
— I, J, K, L, IT = General integer counters
— EC(NE, 4) = Element currents
1 = Mag, 2 = Phase, 3 = Real, 4 = Imag. Phased stored in Radians
— EV(NE, 4) = Element voltages
1 = Mag, 2 = Phase, 3 = Real, 4 = Imag. Phase stored in Radians.
— EP(NE, 4) = Element position
1 = Disp (in wavelengths), 2 = Angle (in radians)
3 = X , 4 = Y, (3 & 4 not used here)
— EA(NE,2) = Element attributes
1 = Diam (in wave lengths), 2 = Length (in wave lengths)
— EZ(NE, 2) = Element impedances, 1 = Mag, 2 = Phase
— XX = Input to sine and cosine integrals
— XC = Result of cosine integral
— XS = Result of sine integral
— PI = 3.141542654
— P2 = PI x 2 = 6.283185308
— DR = Degrees to Radians = PI/180
— EU = Eulers No = 0.5772156649
— TI - 9, x, Z = Temp variables
— DM = Distance in wave lengths for mutual impedance
— ES(NE) = Element series resistance
— FR = Frequency of analysis
— RF = Restart flag 1 = Restart, 0 = Continue
— NN = Accuracy count for cosine + sine integrals
— SP = Sin(PHI)
— ST = Sin(THETA)
— CP = Cos(PHI)
— CT = Cos(THETA)
— SI = Imaginary sum for gain and pattern calculations
— SR = Real sum for gain and pattern calculations
— F2 = Array factor (and total pattern factor)

— F1 = Element factor
— UM = Maximum value of radiation intensity
— PR = Total power radiated
— UA = Radiation intensity
— TH = Theta (degrees)
— PH = Phi (degrees)
— DI = Directivity
— GI = Gain relative to isotropic in dB
— NC = Number of element to be changed
— XP, YP = Plot co-ordinates for pattern graphics
— MX = Maximum value
— RT = Theta (radians)
— D3 = Temp variable

D. Statements Which May Not Exist in all Basics

Line No	Statement	Replace with or Comment
2	Defint, I, J, K etc	Makes I etc integers, not really necessary, can be left out.
1510	On Gosub	On Goto can be used to Goto a table of Gosubs
20000	CLS	Clear screen. Can be left out
16590 & others	Print using	Formatting of output modify to suit own computer
23006	Screen 1	Set up high resolution graphics
23008	Locate X,Y	Position print cursor on screen at X,Y
23016	Circle (X,Y),R,C	Draw a circle centre at X,Y of radius R, in colour C
23019	Pset(X,Y),C	Plot A point at X,Y in colour C
23078	Screen 0	Return to normal screen mode; ie text only
40240 & others	Swap X,Y	Swap contents of variables X & Y can be replaced with three lines and a dummy variable

Corrections to Part 1

The author has made the following corrections to Part 1 (see page 11, August), to clarify the calculations.

Equation 3a. should read:

3a. $F(\theta,\phi)=K*(\cos(90*\sin(\theta)*\cos(\phi))/\mathrm{sqr}(1-(\sin(\theta)*\cos(\phi))^2)$

Equation 4. should read:

4. $F(\theta)=K*(I_1<A_1+I_2<(A_2+(2*\pi/\lambda)*S*\cos(\theta))$

Equation 7. should read:

7. $F(\theta,\phi)=K*{}^{N}\Sigma_{n=1}\, I_n<(A_n+(2*\pi/\lambda)*S_n*(\sin(B_n)*\sin(\theta)*\sin(\phi)+\cos(B_n)*\cos(\theta)))$

Reference 5, the authors correct name is Balanis.

Some confusion is possible in the co-ordinate section, (bottom col 1 page 11), as there is a false impression that X=1, Y=1, Z=1 is the same point as R=1, θ=45 degrees, ϕ=45 degrees. This is not the case. In fact the equations relating the co-ordinate systems are given below.

X=R*SIN(θ)*COS(ϕ)
Y=R*SIN(θ)*SIN(ϕ)
Z=R*COS(θ)

or

$R=\sqrt{X^2+Y^2+Z^2}$
θ=ATAN ($\sqrt{X^2+Y^2}$/Z)
ϕ=ATAN Y/X

The actual equivalents are:
For X=1, Y=1, Z=1 is equiv to R=1.732, θ=54.736°, ϕ=45°
For R=1, θ=45°, ϕ=45° is equiv to X=0.5, Y=0.5, Z=0.707

Cartoon courtesy *The Propagator*

PUBLICATION OF COMPUTER PROGRAMS

Part of the technical editing of computer programs involves running the program. This has meant re-typing it from a listing supplied from the author. Many hours are spent by the editors entering the program, especially if, as does often occur, syntactical errors are introduced.

In future, to overcome this hold-up, alternative forms of program entry may be required; eg cassette, disk, or via a modem. This will enable quick editing. If we do require the program in one of these alternative forms, we will provide the blank cassette, disc, etc, or make the telephone call in the case of modems.

Finally, a word of advice. Computer programs on their own do not make good articles. Please include with any program a description of your algorithm. Articles are much more interesting when they include, not just a description of the **how** but also the **why**. Please use your blackest ribbon for your print-out.

SATELLITE TELEVISION

Australia's commercial television networks have received permission from DOC to relay their programs using AUSSAT. Regional stations will be able to receive the capital city programs and rebroadcast them in their viewing areas.

An encoding system will be used for the next six to 12 months, designed to limit unauthorised reception by electronic enthusiasts and others. Because television encoding technology is new to Australia, the networks will replace this encoding system with one which will be totally secure.

The networks have warned householders in country areas about decoders they may be offered. The decoders will not provide satisfactory pictures and sound during the interim period and will be useless when the totally secure permanent system is introduced.

BLUE CHIP COMPUTERS

A cheap IBM compatible personal computer is being tested on the US market.

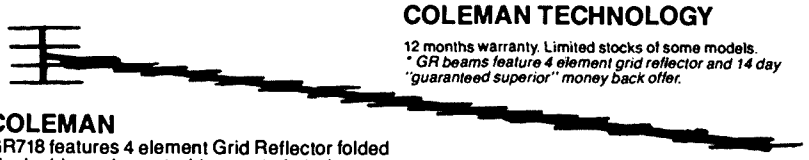
It will sell through discount stores, instead of specialty computer outlets, for US$699 and be the cheapest PC sold through US retailers.

Called the Blue Chip, it undercuts every other compatible computer in the US by at least $200. It has 512 000 characters of memory, one floppy disc drive, a one year warranty, and the operating system used on IBM's best- selling PC.

The computer is the most dramatic evidence yet of the fall on personal computer prices, now 30 percent lower than last summer in the US. Industry leader, IBM, in August cut its price by 20 percent in a move to keep its share of the competitive market.

—Submitted by Jim Linton VK3PC

ANDREWS COMMUNICATIONS SYSTEMS



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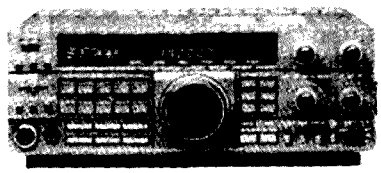

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- Kenwood TW.4100 Dual-bander coming.
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- New BEARCAT/UNIDEN scanners in stock!
- 50XL 10 ch $229. 100XL 16 ch $349

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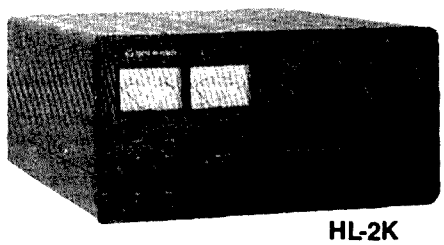

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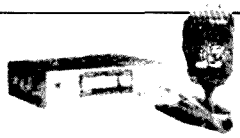

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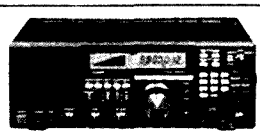

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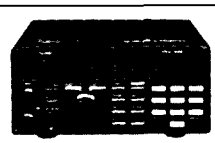
Yaesu FRG-8800 comms receiver allows 150 kHz to 30 MHz full coverage. AM/FM/SSB/CW modes.



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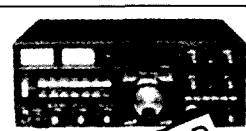
Yaesu FRG-965 V/UHF scanning receiver covers 60-905 MHz. AM/FM/SSB. AC/DC.



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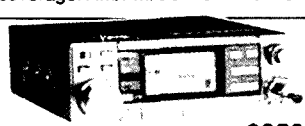

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Part 2 — A 10 MHz Frequency Reference

Kenneth Kimberley VK2PY
21 Nicoll Street, Lakemba, NSW. 2195

The first part of this article described the results of a number of experiments designed to explore the characteristics of crystals and crystal oscillator circuits.

Part two describes the circuit, construction details and the measured performance of a temperature controlled crystal oscillator based on the lessons learned in the previous article.

Now read on . . .

Some oscillator manufacturers oven the crystal only, leaving the overall stability to the vagaries of the associated components. The design described below, controls the entire circuit right down to the last nut and bolt. The plan Is to eliminate, as far as is possible, frequency changes caused by oscillator capacitor change, voltage fluctuations, internal changes within the transistors, not forgetting the mechanical changes.

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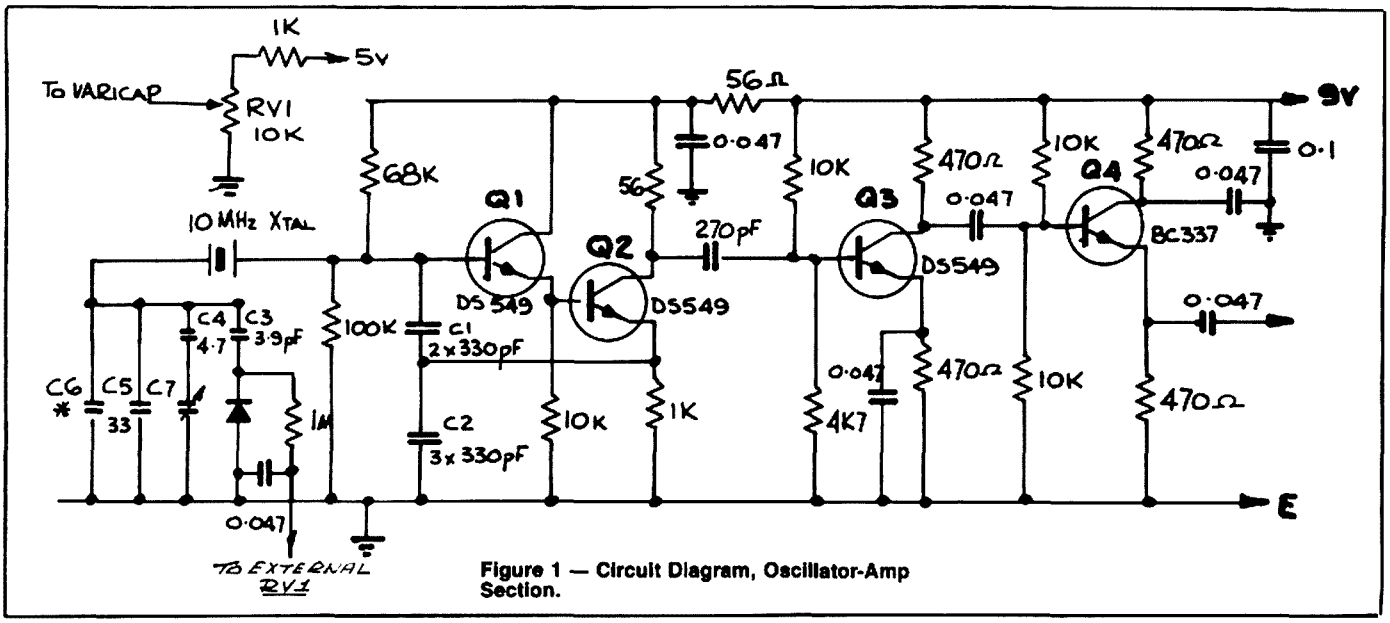


Figure 1 — Circuit Diagram, Oscillator-Amp Section.

Before detailing the construction, a brief circuit description will be presented, refer Figure 1. The signal *part* of the unit consists of *four* transistors. Transistors Q1 and Q2 function in the good old reliable *Colpitts* circuit, Q3 buffers the output whilst Q4 is an impedance converter.

It will be observed that the first two transistors are *Darlington connected.* This configuration gives a greatly increased gain over a single transistor leading in turn to a relatively high input impedance. Higher values of resistance may now be used in the bias network. Practical values of 68k and 100k were arrived at. These high values tend to keep the crystals operating Q higher than that normally attainable with one transistor. This in turn, narrows the bandwidth and hence less oscillator noise. The Darlington allowed the use of 660 pF (2 x 330) and 990 pF (3 x 330) capacitors at C1 and C2.

The use of multiple components made it a little easier to establish the optimum condition. The technique is to gradually increase C1 and C2, whilst monitoring activity and output. A point will be reached where oscillation will not readily commence, hence slightly lower values must be fitted. These high values will also reduce the reaction of internal change within the transistors to a minimum.

The crystal itself was chosen to work into a 40 pF load, but C1 in series with C2 is much higher than 40 pF. However, this problem is overcome by the stratagem of connecting the various trimming capacitors in series with the divider so that the total now becomes = 40 pF At this point, mention is made of what appears to be a rather complex trimmer set-up. The silicon power rectifier (IN4004) is used as a "varicap." Dedicated varicap diodes are much more expensive and do not work any better in this application. Note that RV1 is used as a remote control of its capacitance. This feature is to enable the correction of small drifts, caused by aging, etc, without the necessity of dismantling the unit. The 3.9 pF capacitor C3 limits the available adjustment to approximately 30 Hertz.

C5 and C6 must be adjusted on test and this is done in the following manner. Set C7 and RV1 to mid-point then adjust C5 and/or C6 by trail and error until the frequency is as close to 10.000 MHz as possible. Consideration may be given to fit a "small trimmer plus capacitor" here.

The use of a trimmer here makes for easier adjustment. However, mechanical trimmers have a notoriously bad reputation for uncertain stability. Hence, their use should be avoided wherever practicable. Not withstanding the previous comment, circumstances almost dictate the use of one at C7. However, any problems here are partially circumvented by limiting the total available frequency variation to about 100 Hz. The NPO ceramic capacitor C4 (4.7 pF) is used for this purpose. Stability requirements make the use of high class capacitors around the oscillator mandatory. To this end, C1 and C2 are styroseal, C3 through to C6 are NPO ceramic.

The trimmer C7 is a multi-turn 17 pF unit, available from Microwave Developments, and seems quite stable.

A degree of buffering is gained by taking the output from Q2 collector at the expense of a distorted waveform. This is of no real concern as it will be converted to TTL in the forthcoming square-wave generator. If this represents a real problem it may be readily filtered by a tuned circuit connected externally.

Additional buffering and output voltage is obtained via Q3, a type DS 549. *Note the* lowish coupling capacitor C6 which was kept down to 270 pF This value was selected as a compromise between loading and output. Q4 (BC337) is used as an impedance converter to drive the output coax.

As it is intended to derive the power requirements from the coming square- wave generator, the supply was set at twelve volts. There being two main reasons for this, one being that it may be required to encourage the high frequency operation of reluctant CMOS integrated circuits in the generator, and the other to keep the current lower for a given power in the heater.

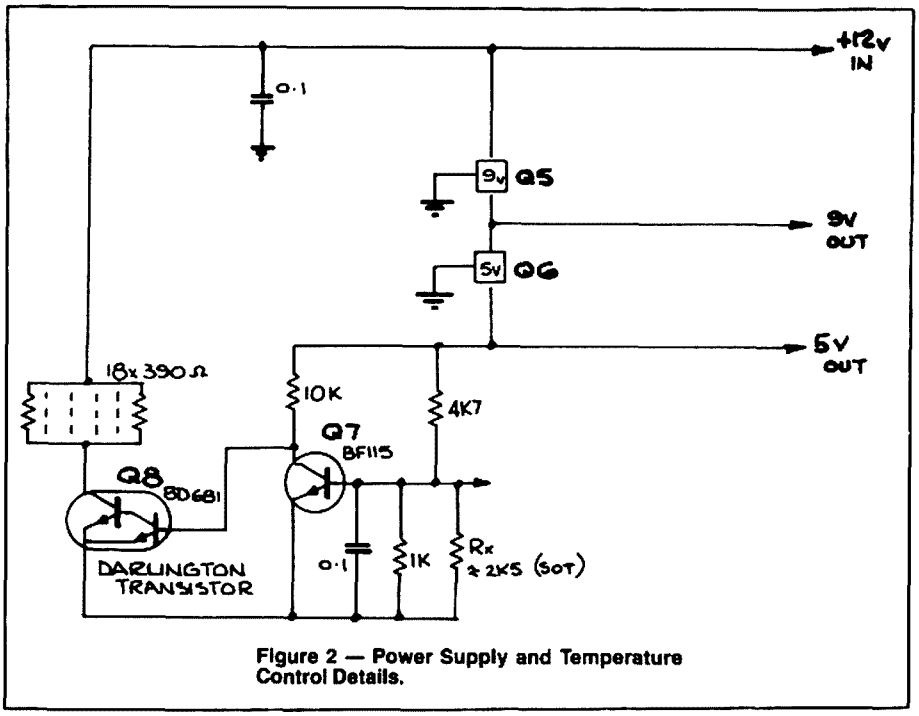


Figure 2 — Power Supply and Temperature Control Details.

CIRCUIT DIAGRAM

There are two on-board regulators provided within the oven enclosure being nine and five volts respectively, (see Figure 2), the former supplying the single electronics, and the latter going to the heat control sensor. Most semiconductors are heat sensitive in one way or another, regulators being no exception, hence the decision to oven them thus ensuring a much more constant output. Note that the prime source, 12 volts, is already regulated, hence the nine volt is doubly and the five, trebly regulated. Therefore, the power source stability should be beyond reproach. The use of a single supply line also reduces by two the number of conductors *going* into the enclosure. This makes the sealing easier and reduces heat loss by conduction.

OVEN HEATER

The heater element, used in the final version, consists of 18 parallel connected 390 ohm metal film resistors.

The energy is supplied from the 12 volt regulated supply, control being via the temperature sensing element Q7 (BF115) driving another *Darlington* (Q8 BD681). Q7 should be mounted in close contact with the crystal cover; ie soldered.

The final operating temperature is set by "R" and needs to be adjusted on test. A variable resistor is not recommended due to their doubtful mechanical stability. However, a multi-turn trimmer is used to ascertain an approximate value. Subsequently replaced by a metal film resistor of the next lower preferred-value and a 500 ohm multi-turn pot (RV2).

All of the electronics is housed inside a die-cast box which is then surrounded by styrofoam, etc. Further insulation and a neater finish is obtained by mounting the unit into a plastic *Zippy Box*.

Figure 4 — Mechanical Details.

MECHANICAL DETAILS

Describing the constructional aspect of this unit appears to be a more difficult proposition than actually doing it, however, please bear with it, even though the following may become a little tedious. (See Figure 4).

Proceed as follows — roughly shape the H5610 Board to the internal outline and dimensions of the die-cast box (DCB). Next, cut clearance notches around each of the four corner blocks. A quick trim with a file and it should fit snugly, resting on the eight webs moulded into the bottom. A three millimetre hole is drilled in a convenient position near each of its corners.

The template, thus produced is used to mark the location of holes in the base. Remember to drill from the inside and de-burr. The DCB is then used in a similar manner to mark the mounting holes on the copper side of the PC-material. Ensure that they fit together symmetrically.

After drilling and countersinking (glass side), screw the two together, complete with lock-washers under each nut. A six millimetre hole should now be made in the control cable end of the DCB.

Temporarily run a second nut and flat-washer down each of the four 2.5 mm screws. These will serve as an adjustable mount for the electronics board, which should now be dropped into place. The vertically mounting heater resistors, being the tallest of the components, should be used to verify the lid clearance. Move the height adjuster nuts for equal spacing top and bottom, and then lock them into place using a little paint, etc.

The method used to mount the DCB into the Jiffy Box is similar to the above, hence this part will be left to the constructor's imagination.

The two pieces of one millimetre bakelite, etc, are used as an insulated base plate. Originally a scrap of aluminium sheet was used, however this proved to be unsuitable due to its good heat conductivity, degrading temperature control.

At this stage mark out and drill a four millimetre hole in each corner of the insulated base. The main earth wire connects from a solder lug, under one of the mounting nuts, through the end of the Jiffy Box onto the PC-material.

The remaining scrap of PC-material becomes as insulator by being cut, trimmed and glued (metal side down) to fit neatly into the base between the webs and the 2.5 mm nuts.

Provision is made for the interface cables via a six millimetre hole in the Jiffy Box. Ensure that the two six millimetre holes do not align with each other. The idea being to reduce unnecessary heat loss. The constructor may, at this time, care to provide a tag terminal handy to the outside six millimetre hole.

Obtain and cut to size the various insulating pieces, which will later be fitted between the six faces of the DCB and the Jiffy Box. Satisfactory material includes styro-foam, old PC-material, mica, and bakelite.

WIRING

That about completes the metal bashing, so now we will look at the wiring. The first stage to be addressed is a general layout of the board. Allocate about 50 percent of the available space to the oscillator; ie Q1, Q2 the 10 MHz crystal, its socket and the various tuning capacitors.

The remaining space accommodates Q3, Q4, Q5, Q6, plus associated minor components, as well as terminating pins, etc.

Note that pins are provided for all parts that could require changing during the adjustment routine. Pins are also provided for the semiconductors and the crystal socket. With the benefit of hindsight, it may have been prudent to use a wire-in type of crystal, thus eliminating a possible future trouble spot.

The electrical earth bus system is installed as follows. A 10 mm strip of copper (or tin plate) goes across the oscillator end of the board, leaving one clear row of holes which will be used for the temperature control transistor and its circuitry. Holes should previously have been drilled through the earth strap to coincide with those existing in the electronics board. Likewise, fit a solder lug over the remaining holes at the other end of the board. These two lugs are connected together by bare stiff number 18 *gauge wire*, which is then *extended* parallel to, and approximately eight millimetres from the bottom edge, along to the copper strip. Remember to leave sufficient space for the heater resistors.

The positive supply rail runs along the top edge spaced as per the earth line. However, it stops short of the middle, the exact point should be immediately adjacent to the collector of Q3. Bare tinned wire is again used and is soldered to strategically placed pins. The Q3 end is extended by means of the decoupling resistor and finishes with another pin opposite Q2 collector.

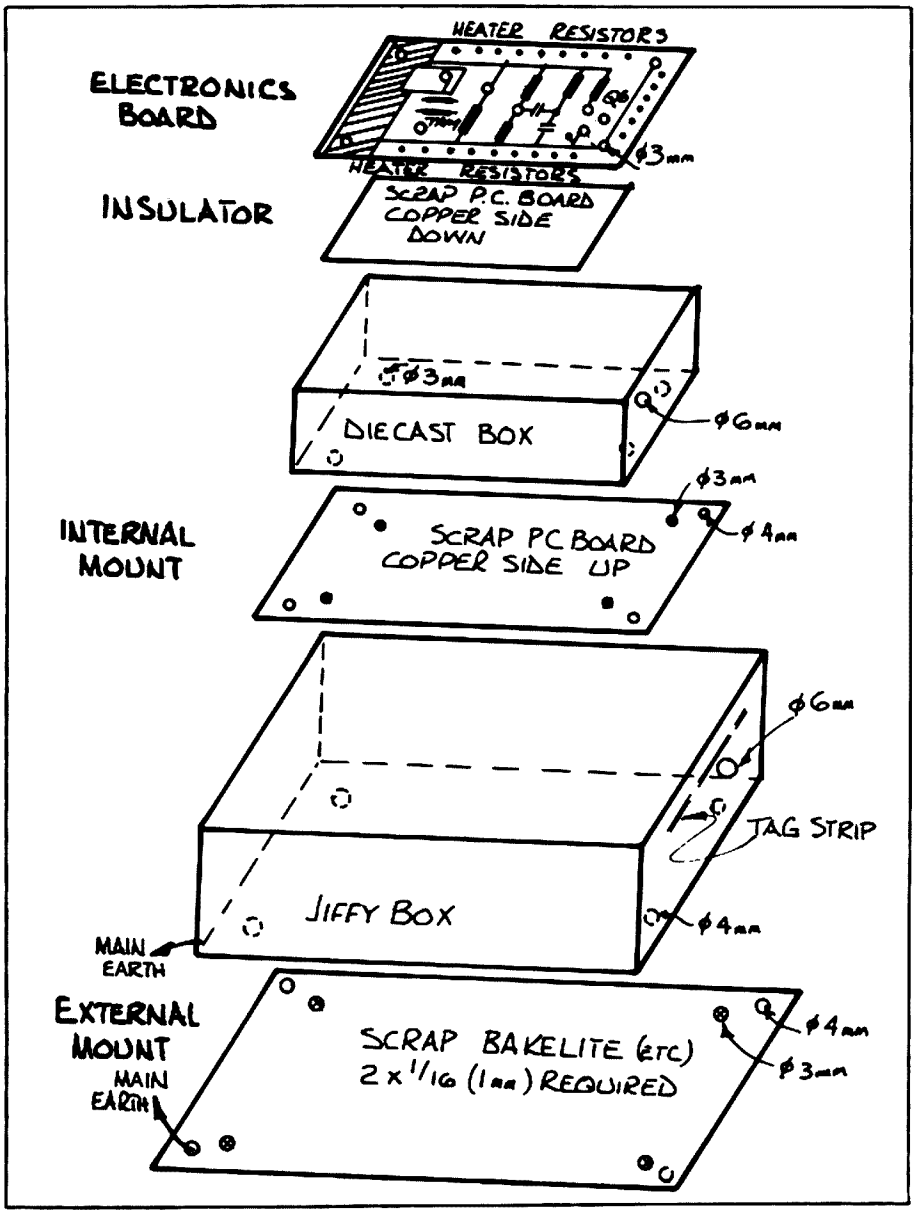
Prior to the actual assembly, it is strongly recommended that all of the component parts be placed on the bench top and moved around until a suitable configuration is arrived at. The layout of the remaining circuitry almost suggests itself; ie the DC supply is from the top to the bottom of the board, whilst the signal path is from the left to the right.

With the above in mind, insert the pins for the transistors. The base pins for Q3 and Q4 should be on the centre line, emitter Q1 and collector Q2 likewise. Now wire in the various resistors associated with the transistors. These go direct from the supply rails to the transistor pins, via conveniently placed lands on the board.

The control pins are now inserted and are grouped vertically close to the right hand end of the board. At this stage, find a suitable position for the two regulators and insert their respective pins.

Now we are coming to the actual oscillator. This is wired in a similar manner; ie a judicious mixture of pins and tinned wire. The crystal is placed flat on the board and extends approximately half-way over the copper strip to which it is firmly connected (soldered) by a short length of wire. Now fit the oscillator pins into their assigned position, where necessary connect together and then solder in the various tuning capacitors.

Mention must be made of the temperature sensing transistor, Q7. This is connected to its



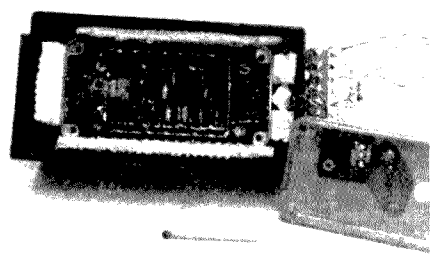
circuitry via pins at the extreme end of the board. These are positioned in such a way that the transistor may be bent over and soldered onto the crystal can.

The remaining components, including the semi-conductors, are now wired in. The control wires for the varicap and the temperature sensor should be routed as far as possible from the oscillator circuitry and made rigid by gluing to the board.

The time is rapidly approaching, when the constructor begins to see some results. The unit may now be powered up, but first switch on the station frequency meter or digital readout equipped transceiver and allow them to warm up. Next, run five wires temporarily, three to RV1 and two to the 12 volt supply.

Connect the counter, etc, to the 10 MHz output pin, switch the supply on, stand back and carry out the old "smoke test." If all is well, shift attention to the counter which should be counting away merrily.

The frequency should be quite close to 10.000.000 provided that the specified crystal and components were used. Note that other manufacturers equivalent components may be used as long as the calibration tolerances are similar.



Internal View.

Preliminary frequency adjustments may now be made; remember a final touch up will be required later. C3, C4, C5 and C6 are organised as follows:

1. Set RV1 and C7 at mid-point.
2. Leave C3, C4, and C5 as specified.
3. Trim C6 until frequency is very close to target, if possible to within 20 Hz and preferably on the high-side. (Strays will be higher when the board is in the DCB).
4. Rotate C7 from minimum through to maximum. Hopefully, the frequency excursion will be in the order of 100 Hz. If not, change C4.
5. Return C7 to mid-point and rotate RV1 from minimum through to maximum. This time the frequency excursion should be about 30 Hz.

When satisfied with the above adjustments mount the oscillator into the DCB, not forgetting the under-board insulator and spring washers under the fixing nuts.

FITTING TEMPERATURE CONTROL

At this stage a little more metal work and wiring is required. Firstly a six millimetre hole should be drilled in the lid immediately above C7. A second hole needs to be provided for the thermometer used in setting up.

This is kept away from both the crystal circuitry and heater resistors. A point midway between Q1 and Q2 and a little above the centre line is a good spot. Even so, inserting the thermometer moves the frequency a few Hertz.

The BD681 oven controller should now be fitted to the inside of the lid. Mount it opposite the thermometer hole and as near as practical to the bottom edge. The transistor leads should face away from the oscillator circuitry and arrangements made for the connections to come out of the lid. These wires should be firmly fixed so as to prevent any possible instability.

The method used by the author was as follows. A 10 mm hole was drilled in the lid and then covered by *Vero-board*. Three circuit pins were then inserted and Q8 wired to the appropriate tracks.

INSULATION

The next step is to mount the DCB as follows. Fit the thermal insulator into the bottom of the Jiffy Box and then screw in the DCB. Run the control; wires, etc, through to the tag strip at one end, whilst the earth wire goes out though the other.

Make one last inspection of your work, and if it is okay screw the lid firmly onto the DCB. Next pack insulation between between the four edges of the DCB and the Jiffy Box. Cut another insulating piece and lay it on the top.

TEMPERATURE ADJUSTMENT

The oven operating temperature is set as follows. Temporarily connect a 10 kohm multi-turn pot, or decade box to the Sensor Control Points and set it to maximum "R." Next insert an ammeter in series with the power supply, and place the thermometer into the designated hole. Ensure that it rests on the oscillator board and is safely supported, externally, so that it cannot fall over and break. (Thermometers are too expensive and inconvenient to replace).

Switch the supply on and observe the ammeter. At this stage, the oven heater should be biased off and the meter will indicate only the current being drawn by the electronics.

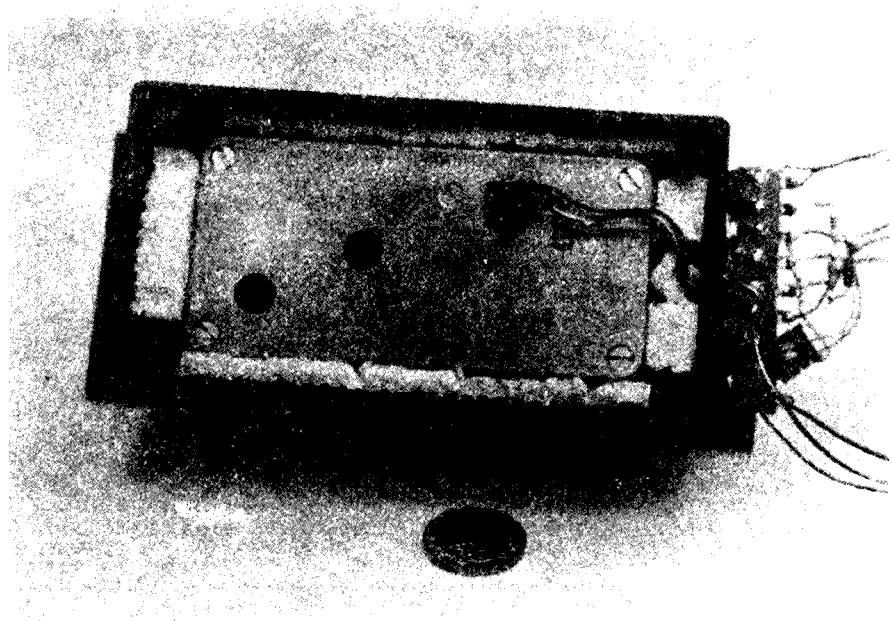
Carefully adjust the 10k pot whilst monitoring the ammeter. A point will be reached where the current will gradually increase to approximately 500 mA. Now "back-off" the pot a little so that the heater current drops to 450 mA.

The temperature inside the box will commence to rise and the current slowly decrease until stabilising at around 200 mA. Carefully repeat the adjustment several times until the temperature gets to around the 60 degree Celsius mark.

SENSING RESISTOR

When the indicated temperature reaches that

Unit showing the Frequency Adjusting and Thermometer Holes, Over Element Wiring and Heat Insulation.



which is desired, switch off, disconnect and measure the set resistance of the multi-turn. Now obtain a metal film resistor of the next lower preferred value, build it up to approximately 250 ohms lower than the measured value of the "preset."

This network, along with RV2 (500 ohms) is then soldered onto the tag strip.

The author's model required a resistance of 2.615 kohm and was made up with a 2.2 kohm in series with a 220 ohm unit, RV2 making up the final value.

STABILISING TIME

Re-power the unit and allow it to settle for at least one hour. The relatively long stabilising time is due to the low heater power of six watts, and the large thermal mass of the oven enclosure.

If the temperature is other than desired, trim RV2 a little, again allowing a similar settling time.

When all is well, leave the unit run overnight. This long run will eliminate an initial tendency to hunt and should ensure that the temperature gradient within the stabilised oven is minimal. RV2 may require further trimming after this period.

FINAL FREQUENCY ADJUSTMENT

The stage has now been reached where the final frequency adjustment is made. Assuming that the crystal oscillator has been running continuously for at least one week, proceed as follows:

Method One — This is used where a good counter is unavailable.

a) Tune to WWV or a similar station on a general coverage receiver.
b) Set the receiver to AM-mode — narrow selectivity — and plug in headphones.
c) Tune C7 for maximum "C" through to minimum whilst carefully listening to the beat. The zero will be a little difficult to detect due to the modulation present. With care it should be audible as a low pitched note of approximately 50 Hertz at each end of C7's travel. As C7 is rotated, the note will become lower until it falls below the ears low frequency response, and will reappear on the other side.

Note the zone of inaudibility, and set C7 at the middle. The average ear fails at about 25 Hertz and therefore the area of uncertainty will be ±25 representing a possible error of 2.5 ppm. However, in practice, it should be better than 1 ppm. The use of a CRO and a simple low pass filter (150 kohm resistor and a 0.1 mF capacitor) should assist in the setting of the zero point to better than one Hertz. Use RV1 to do the final trimming.

Method Two — Using A Frequency Counter

The counter used by the author for all of the development work was a Leader type LDC 85, which has an ovened time base and is specified accurate to ±0.03 ppm ± one count. Any error introduced as a result of the stated tolerance may, for practical purposes, be neglected.

a) Switch counter on and allow it to stabilise for several hours.
b) Set time base to one second.
c) Adjust C7 until counter indicates 10,000,000.
d) Change time base to 10 seconds.
e) Fine trim, with RV1, to 0.000.000.0 (overflow).

Method Three — Lissajous Patterns

The equipment requirements here are: i. A CRO which has both the vertical and horizontal deflection circuitry available for the inputing of external signals and ii. an accurate reference frequency source. Maybe a counter with a lower resolution than required for Method Two, but utilising an ovened crystal.

a) Have frequency reference fully stabilised.
b) Connect reference to the horizontal input and the oscillator under test to the vertical (or vice-versa).
c) Adjust levels to obtain a convenient sized pattern.
d) Carefully adjust C7 until a nearly stationary circle is displayed.
e) Fine trim with RV1.
f) Remove test equipment but leave your oscillator running.

Method Four —

This method is used where both deflection circuits are not accessible. In this case, a standard dual beam CRO may be used. Proceed as follows:

Connect "the frequency reference", or whatever, to channel one and then select time base to 0.1 uS per division, the gain to give a picture of about four divisions high, and the synchronising to channel one.

Feed the oscillator under test into the other input and again set the controls to give a similar sized picture.

Slowly move C7 whilst watching trace two. Gradually a sine wave will appear, moving from one side to the other as the trimmer is adjusted. A point will be reached where the direction reverses. Stop, when this appears, you have gone too far. Again use RV1 as a final trimmer and set it so that both traces are rock steady.

Method Five —

This method may be used when only a simple single beam CRO is available. Connect both signal sources together via a suitable resistor pad, capacitors and diode. Thus forming a simple mixer.

a) Connect the output from this mixer to the CRO and adjust gain to suit.
b) Adjust C7 to near zero beat.
c) Trim with RV1.

Each of the above methods has its own shortcomings:

1. The main problem here is the modulation WWV.
2. The accuracy of the counter time base.
3. The accuracy of the reference source.
4 & 5. As for three.

The author used Method Two for all of the development work and Method Four for the final adjustment. However, whilst overall accuracy is highly desirable, the main requirement is really stability and repeatability.

AGING

This parameter is rarely mentioned in the general run of amateur radio literature, as it is usually well masked by other aberrations. However, this project has been developed to a stage where the aging shift predominates.

The main causes of aging are contamination within the holder that is redistributed with time, slow leaks, mounting and electrode stresses which are relieved over a period, and "oil-canning." The latter problem is where barometric pressure acts on the crystal can. Positive aging is the most common type and is usually due to the transfer of contamination from the vibrating surfaces. Generally, negative aging is due to leaks in the can.

Following the frequency setting, the oscillator was left running continuously for a period of 300 days, the frequency was measured and plotted daily. In the interests of consistency all measurements were taken at the same time of the day.

Figure 3 shows the results in a compressed form. The readings for each 10 day period were averaged and then plotted. The graph shows that the aging rate exceeded 0.1 Hertz negative per day for the first seven weeks, and then settled down to about 0.06 Hertz until day 150. An unexplained positive movement developed for the next 20 days, then returning to 0.06 negative.

The change, over 300 days, totalled some 17 Hertz, which averages out to 0.057 per day (0.006 ppm). This represents a yearly rate of 2.1 ppm and compares favourably with the generally accepted industrial rate of 3 ppm for resistance welded holders.

Further improvement may be had by using a crystal with a cold welded can or, even better, a glass mounted type. These types have an aging rate of about two and one ppm respectively. A dual oven; ie one within the other, would also help, however one has to stop somewhere or end up emulating the famous Dodo Bird and its ever decreasing circles.

Moreover, proceeding along these esoteric paths leads to more troubles than both

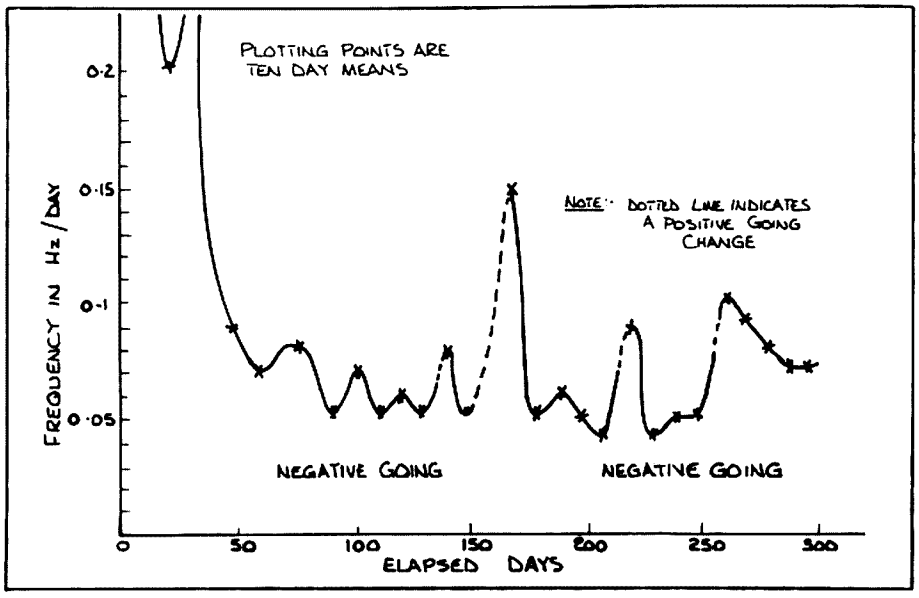


Figure 3 — Aging Characteristics using Crystal Type KBD 40.

Pandora and *Murphy* together could ever dream up. Not the least being the measuring accuracies required and of course that ever present problem — cash!

SUMMARY OF RESULTS

At this point, the project was terminated and a summary of the results were obtained. They are as follows:

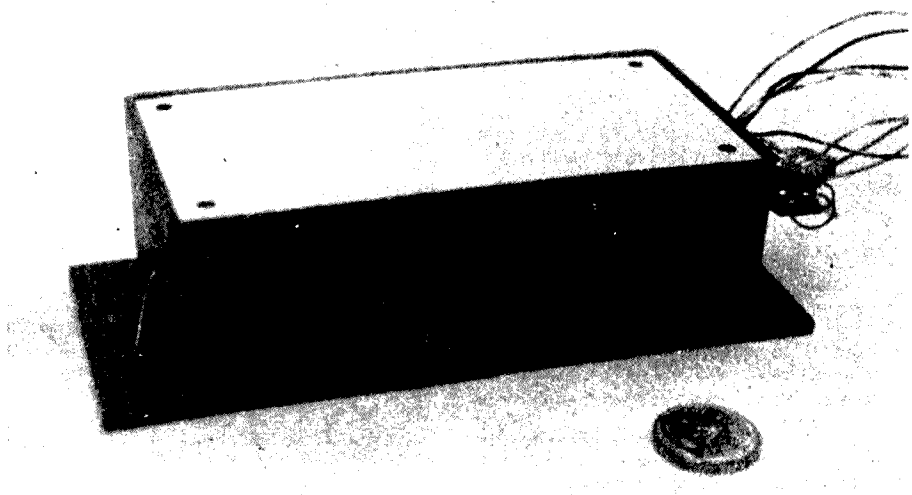
Nominal Frequency	= 10.000.000 Hertz
Daily Stability (including aging)	= ± 0.1 Hertz = 0.01 ppm
Aging Rate per 10 Days	= -0.6 Hertz = 0.06 ppm
Yearly aging	= -22 Hertz = 2.2 ppm
Oven temperature	= 55.5 degrees Celsius at 23 degrees Celsius Ambient
Oven Temperature "Jitter"	= ± 0.1 degrees Celsius at 23 degrees Celsius Ambient
Oven Temperature	= 54.8 degrees Celsius at 43 degrees Celsius Ambient
Oven Current (during warm-up)	= 500 mA (= 6 watts)
Oven Current (sustaining)	= 200 mA (= 1.2 watts)

It is imperative that this unit runs **continuously** otherwise the performance will be degraded.

PARTS LIST

Resistors Value ohm	Quant	Source Dick Smith Code
56	2	R 0544
390	18	R 0564
470	4	R 0566
1.0k	3	R 0574
4.7	2	R 0590
10	5	R 0598
68	1	R 0620
100	1	R 0624
1M	1	R 0648
10k Multi-turn Pot	1	R 1901

Capacitors pF		
C1 660	(2 x 330) Styro	R 2831
C2 990	(3 x 330) Styro	R 2831
C3 3.9 NPO	1	
C4 4.7 NPO	1	
C5 33 NPO	1	
C6 Adjust on test		See text
C7 17 Multi-turn Trimmer		Microwave Developments
C8 270 Styro		R 2839
47 nF Ceramic	7	R 2327
100 nF Ceramic	3	R 2360
Semi-Conductors		
DS549 Transistor	3	Z 1319
BC337 Transistor	1	Z 2910
BF115 Transistor	1	Z 1560
BD681 Darlington	1	Z 1462
IN4004 Silicon Diode	1	Z 3204
78L05 Regulator	1	Z 6108
78L09 Regulator	1	
Miscellaneous		
Die Cast Box (100 x 50 x 25 mm)	1	H 2221
Jiffy Box (130 x 68 x 41 mm)	1	H 2763
IC Board (Cut Down)	1	H 5610
Scrap Board		
1 mm Bakelite		
Circuit Pins		H 5590
Screws, Nuts, Solder Lugs, etc.		



Overall View of the Completed Unit.

TELEVISION

The inauguration of an "experimental" regular television service by the BBC in November 1936, aroused sufficient public interest to justify television making steady progress towards a wider popularity. The proviso was that "so long as good programs can be maintained."

The opening ceremony was conducted alternately by the Baird and Marconi-EMI systems.

The transmitting apparatus was installed in the Alexandra Palace, with each company installing separate equipment.

The Baird system was on 240 lines whilst the Marconi-EMI was on 405 lines.

In the Baird system, three different types of scanning equipment were provided — for studio work "Spotlight" scanning was used — a beam of light was focused through a small water-cooled rectangular window situated at the top of a scanning unit. The scanning disc revolved at 6000 RPM with 240 apertures arranged in four spiral traces, whilst a second disc had a spiral slit and acted as a shutter so that only one of the 240 holes was exposed to light at any one instance.

The transmitter used crystal control, the crystal oscillating at 1.406 MHz, with the output being passed through amplifiers and frequency-doublers.

The Marconi-EMI system was completely electronic, with an Emitron camera employed as a link between the visible and electrical. The basic unit, a pulse generator, provided the necessary pulses for operating the camera and synchronising signals.

—From *Wireless World*, 1936

INTERNATIONAL E-POST

A new electronic mail service, available through Australia Post, guarantees next working day delivery from Australia to over 20 000 towns in the United States of America.

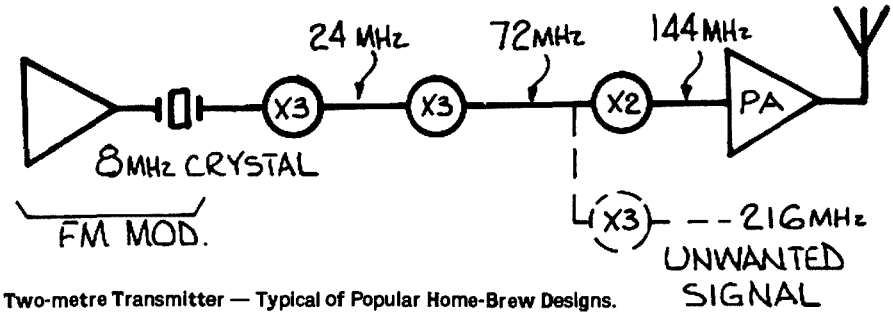
The service, International E-Post is aimed at the Australian and American businesses who require fast delivery. Documents are hand delivered to an electronic mail-equipped post office and then transmitted to a post office in the US.

The message is then printed on high quality paper complete with company logo and signature if necessary and then delivered by courier or mail to its final destination.

DESIGN OF A BAND-PASS FILTER FOR THE TWO-METRE BAND

B P Dilworth VK7BD
4 Anson Street, Waverley, Tas.

Having recently acquired an older style solid-state two-metre FM transmitter/receiver, on air tests showed that there was noticeable output on 216 MHz.



Two-metre Transmitter — Typical of Popular Home-Brew Designs.

This is 'spot-on' on channel 11 (our local television translator output), which caused television interference when transmitting.

The 216 MHz output was of a low level but it still caused problems in the local area. The unwanted output was a result of the transmitter's design for no filtering was provided in the output stage — this situation is not uncommon amongst some simpler transmitter designs.

SOURCE OF PROBLEM

The 216 MHz output is a result of the third harmonic output of the 72 MHz stage; ie the 72 MHz signal is doubled to give a desired 144 MHz output, but some tripling to 216 MHz also takes place.

(This problem is a common result of excessive drive applied to the doubler stage. It is always good practice to include a series resonant trap at 3xf across the input of PA — Technical Editor).

SOLUTION TO PROBLEM

Two possible solutions were considered:
(a) re-design of the PA-stage to further suppress unwanted output
(b) add an external bandpass filter to reduce out of band signals.

Not wishing to alter the design of the transmitter as in (a) (with the possibility of introducing more complex problems) it was decided to choose alternative (b) — design a suitable 'out-board' filter. This choice was also chosen as, having built very simple two-valve type transmitters (Mini Tran 2 — March 1962 AR), the filter could also be used to "clean" this up also.

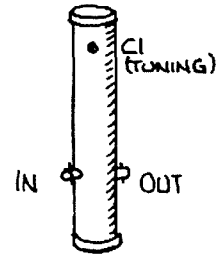
After studying the various alternatives, I finally settled on the coaxial cavity type, as described in various ARRL publications, but modified to suit locally available materials.

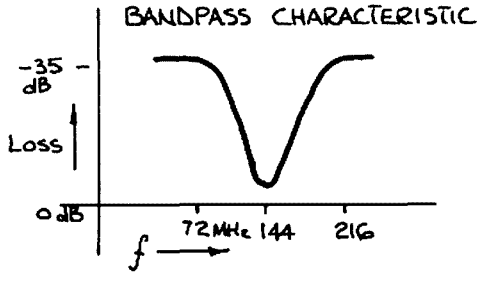
DESIGN

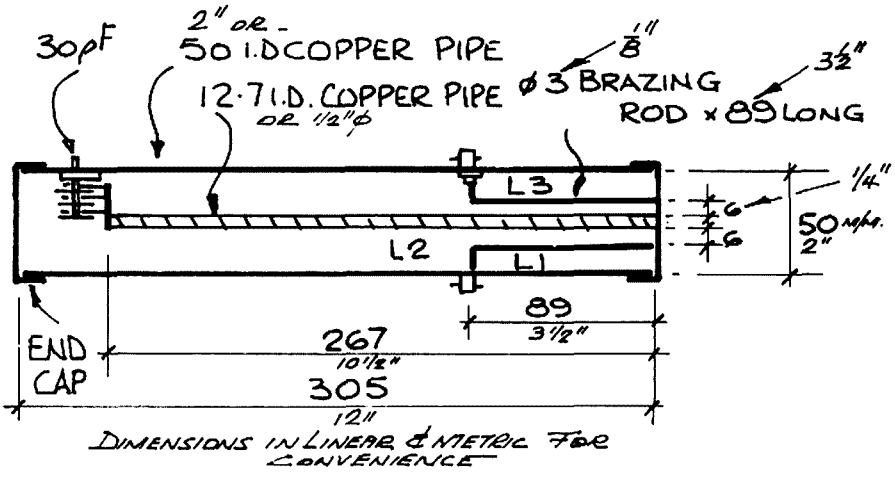
The design is shown in the accompanying diagrams — note the use of older imperial measurements — this was done as older copper pipe was used having imperial dimensions.

The diagrams should be self-explanatory. All rods and half-inch pipe are soldered to the brass cap. The capacitor C1 is fitted between the outer and inner pipe. It also provides support for the top of the inner pipe so the use of a mechanically strong ceramic insulator is not required. Whilst on C1, use a type with a lockable shaft or stiff movement as this sets the passband and should be 'bump' proof.

(The Q of the filter is high and, as such, minor variations in C will cause a significant variation in the resonant frequency of the filter — Technical Editor).







Coaxial Cavity Filter for the Two-Metre Band.

ON AIR TESTS

The filter was connected between the transceiver and antenna and peaked to give maximum transmit output power to the antenna. There was no noticeable change in signal reports given with the filter in-line or removed from circuit.

A portable colour television was placed near the transmitter and channel 11 selected. With the filter out, the television was overloaded and the received program totally lost. When the filter was connected, the television showed no signs of interference — thus the problem was solved.

Running one watt of transmit output power with the two-metre and television antennas ≈ one metre apart only slight interference occurred. This also happened with a commercially built transmitter, so pure front overload of the television (a mid-range Japanese model) is suspected.

REFERENCES:
QST, 1964 — ARRL
Amateur Radio Handbook 1976 — ARRL

DECISION APPEAL

Jack Ravenscroft VE3SR, has decided to appeal the Ontario District Court decision that put him off the air and forced him to pay damages and costs for allegedly interfering with the operation of electrical and electronic equipment in a neighbour's home.

Although no additional court appearances will be involved, the appeal process will take many months and cost many thousands of dollars.

From *CRRL News* April 30

SMALL SIGNAL BJT AMPLIFIERS

Don Law VK2AIL
RMB 626, Adelong Road, Tumblong, NSW. 2729

How to use the BJT from square-one without resorting to copying a design.

Although a vast number of Bipolar Junction Transistors (BJT) have disappeared into one or another form of *chip* it is still easier to build say, a microphone preamplifier or whatever, with a BC109 than to reach for a 741 op-amp.

This article describes how to use the BJT from square-one without resorting to copying someone elses design. Since thermal runaway problems went out with germanium devices, a simple circuit as described in Figure 1 may be used.

(In any event, providing that when

$$V_c = V_{cc}/2$$

the collector dissipation is within the manufacturers rating, thermal runaway cannot occur because whether V_c increases or falls from this value P_c reduces.

$$P_c = V_c \times I_c$$

Work it out for yourself).

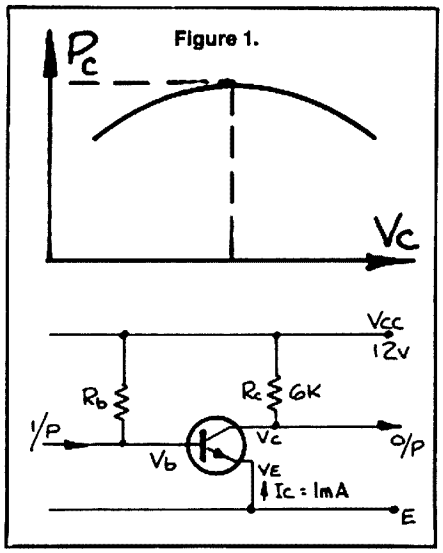


Figure 1.

It is usual to arrange for the collector current (I_c) to be around 1 mA. (The manufacturers beta spread and other data are usually given at this current). To obtain the maximum undistorted voltage output swing, R_c is calculated to drop half the supply voltage, V_{cc}. Thus with a 12 volt supply:

$$R_c = (V_{cc}/2) / I_c = (12/2)/1\text{ mA} = 6k$$

R_b is found by experiment and may vary between 270k and 1M or more. The voltage gain (A_v) is quite high and is found by dividing a magic figure (26 to 30 mV) by I_c (mA) and then dividing the result into R_c.

ie 6000 divided by 30/1 = 200

This is the 'unloaded' gain. When coupled to another circuit the effective value of R_c and hence the gain is lowered by the input Z of the next stage being in parallel with R_c.

Figure 1 is quite adequate for a one-off amplifier but suffers the disadvantage that a replacement device in the event of failure would be unlikely to have the same beta so R_b would have to be re-selected also.

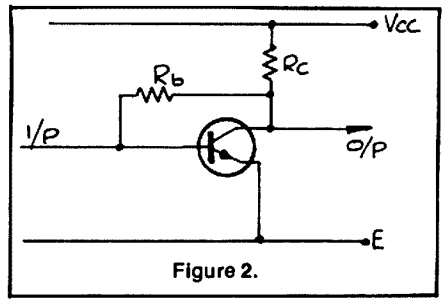


Figure 2.

Figure 2 largely overcomes this problem by providing a large degree of self-adjustment due to DC negative feedback. A BJT with a higher beta would have a lower collector voltage were it not for the fact that less voltage across R_b reduces I_b which in turn reduces I_c thus V_c tends to stay where it was, and vice-versa.

Some AC negative feedback occurs but because R_b is large compared to the base input impedance, the voltage gain is almost that of Figure 1.

Where a fixed, low order gain is required, Figure 3 may be used. That is a line amplifier for a microphone with a gain of 10.

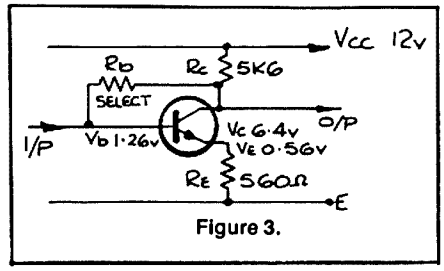


Figure 3.

Here the gain is 'built-in' and is the ratio of R_c/R_E. An added advantage is the reduction of distortion due to negative feedback via the unbypassed emitter. It may also be advantageous that the input Z is considerably increased; ie as before:

A_v = R_c divided by 30 mV/I_c (mA).

(The latter quotient is called little re) but in Figure 3 the value of big R_E must be added:

ie $A_v = R_c / (re + R_E)$ but because R_E is large compared to re,

$A_v = R_c/R_E$ is near enough.

In both Figures 2 and 3, R_b will only be half the value of Figure 1 because the voltage across R_b is halved.

The voltage across R_c, the BJT and R_E should be arranged so that V_{Rc} and V_{cE} are approximately the same. For a 12 volt supply and I_c = 1 mA the values given are satisfactory.

Figure 4 is the full blown beta independent arrangement which, once designed, is guaranteed to work with any transistor of that type out of the box.

Three bits of information are necessary: ie a BC109.

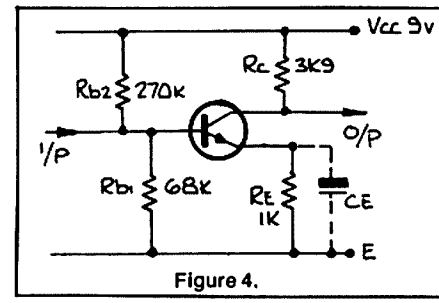


Figure 4.

1. V_{cc} . . . say 9 volts (your choice)
2. I_c . . . say 1 mA (your choice)
3. Beta . . . say 400 (manufacturers data)

There is no reason why V_E should or should not be about one-tenth of V_{cc}.

Since R_E will be sufficiently large to compensate for beta variations (between devices) and because one-tenth of V_{cc} will not be missed, this proportion seems sensible. At I_c = 1 mA and because I_b is so small, $I_E = I_c$ (near enough).

So $R_E = V_E/I_E$ = say, 1V/1mA = 1k

This leaves 8V across the BJT and R_c so R_c must drop 4V DC.

R_c = 4V/1mA = 4k

Using the lower value of the beta spread (400 to 800) makes

$I_b = I_c/400 = 2.5\ \mu A$

Since the 'bleed' current through R_{b1} and R_{b2} must be large enough to stabilise the base voltage (V_b) a value equal to I_b x 10 is chosen. (Lower currents may be economical when using battery power but beta independence may suffer. Higher values, and lower resistor values may unnecessarily lower the input impedance of the circuit). Thus

$I_{(Rb1 + Rb2)} = 25\ \mu A$ and $(R_{b1} + R_{b2}) = 9V/25\mu A = 360k$

There are several ways of calculating the voltage divider but the simplest is probably by proportion; ie

$$R_{b1}/R_{b1} + R_{b2} = V_b/V_{cc}$$

or

$$R_{b1}/360k = 1.7/9\ (V_b = V_E + 0.7 \text{ for Si})$$

By cross multiplication:

R_{b1} = 1.7 x 360k/9 = 68k. R_{b2} = 360k - 68k = 292k

The preferred values given in Figure 4 will not adversely affect the operating parameters. With R_E unbypassed A_v = 3.9. A_v with R_E bypassed is approximately

$R_c/re = 3900/30 = 130.$

Calculations using different data are an interesting and rewarding exercise and it is a worthwhile project to program the computer for quick results. You will find, for instance, that varying R_c has little effect on I_c, (unless it is so high that the BJT is 'bottomed'; ie V_c is too low; one or two volts), a popular misconception. Why should it, looking back into the collector you have an extremely high Z. (A NiCad charger maybe? A constant current source).

Achieving maximum gain is also a giggle. For

very small signals (out) V_c may be lowered; ie R_c increased but if you want the full O/P swing with V_c near $V_{cc}/2$ then you will have to reduce I_c also. Since $A_v = R_c/re$ and because re = 30 mV/Ic you will find it quite a battle. Increasing R_c and V_{cc} (and modifying the base voltage divider) will produce greater gain but do not exceed the makers maximum V_{cc}.

Input Z is $R_{b1}//R_{b2}//R_{base}$ and since R_{base} = beta x re = 12k then R_{b1} (in particular) does not seriously reduce the I/P Z.

Output Z is 3k9 unloaded but nearer 2k7 when coupled to a similar stage.

A_v would then be 2700/30 = 90.

You will also find that beta variations make no difference to calculated values of R_c and R_E but cause changes in base divider values and, of course, I_b and I/P Z.

In conclusion, these are 'small' signal amplifiers and whilst they are okay for microphone amplifiers, they will severely distort a crystal pick-up output unless a series resistor of some 330k in the base signal circuit is included. Good Luck!

DEVELOPMENT OF TELECOMMUNICATIONS

△ In 1945, there were 41 million telephones in the world. The total today is 668 million — an increase of 1500 percent or seven percent per year over 40 consecutive years. As new services develop — telefax, data transmission, teleconferencing and others — there are no signs yet of a slowing down of this growth.

However, it is interesting to note that three quarters of the world's telephones are located in eight countries only, and the developing countries with 70 percent of the world's population are using only seven percent of the telephones.

From Telecommunication Journal — Vol 53, IV/1986

SATELLITES IN BUSINESS

△ Satellites are not only changing the face of broadcasting, they are also changing that of business. Today, major growth is occurring in the United States market for private satellite networks, and a number of satellite systems specifically designed to service the telecommunication requirements of business have been developed.

Annual sales of private satellite network earth stations are now estimated at US$315 million.

Private satellite networks offer business voice, data, facsimile, and audio and video teleconferencing services.

From Telecommunication Journal — Vol 53, IV/86

CHIP PERFORMS UP TO 48 MILLION OPERATIONS PER SECOND

Philips is launching a 2 μm, single-chip, CMOS Digital Signal Processor (DSP) capable of eight million instructions per second (8 MIPS) and up to six concurrent operations in each instruction — an equivalent total of 48 million operations per second.

The high throughput of the PCB5010 results from a highly parallel, pipe- lined Harvard architecture consisting of two 16 bit data buses and five functional sections all working in parallel. The new DSP offers a short instruction cycle time of 125 ns.

from Electronic News, June 1986

ENERGY RATINGS

Refrigerators and freezers sold in Victoria will have to be labelled indicating their rating of power usage. The labels have from one to six stars — the more stars the more energy efficient is the appliance.

The scheme applies to refrigerators from December 1986 and freezers from March 1987.

MODIFYING THE AZDEN PCS-4000 FOR A 5/25 kHz STEP RATE

David Horsfall VK2KFU
PO Box 257, Wahroonga, NSW. 2076

The Azden PCS-4000 is a popular two metre transceiver but it lacks provision for a step/scan rate of 5/25 kHz.

The Azden PCS-4000 is quite a popular two metre transceiver, allowing a good deal of control from the front panel and the microphone. One thing that it lacks, however, (in common with many other rigs, I hasten to add) is the provision for a step/scan rate of 5/25 kHz, as opposed to the 5/10 kHz supplied as standard.

It seems that Australia is one of the few countries in the world utilising a 25 kHz channel spacing on the two metre FM subband, however the PCS-4000 is remarkably easy to modify in this regard. All that is required is a signal diode (1N914, etc), a bit of wire, a fine-tipped soldering iron and plenty of patience!

Reference to the circuit diagram shows that it is simple to convert the 10 kHz rate to 25 kHz. All that is required is a link between the "K3" and "R5" scanning lines as well as between "K1" and "R5" when the "STEP" button is depressed. Refer to Figure 1 for the Truth Table. It should be mentioned at this point that despite the apparent complexity of the control panel, very few functions are "hard switched" — which is to say that most functions are accomplished by scanning various control lines with suitable decoding firmware.

Figure 1 — "Step" Truth Table.
1 — Diode in
o — Diode Out

	R5							
Step Rate kHz	**5**	**10**	**12.5**	**15**	**20**	**25**	**40**	**50**
K3	o	o	o	o	1	1	1	1
K2	o	o	1	1	o	o	1	1
K1	o	1	o	1	o	1	o	1

CONSTRUCTION DETAILS

Remove the top and bottom covers, thus allowing the front panel to be removed. Most of the "body" is taken up with the RF section, with the microprocessor living just behind the front panel. The knobs are easily pulled off, allowing the front panel to slip off. There is a small board containing the three switches (STEP; SCAN and TONE) that can now be unscrewed. Try not to lose these tiny screws in the interior of the rig — it is embarrassing having to turn it upside down and shake it! Besides, they can do nasty things should they happen to contact the internal battery . . .

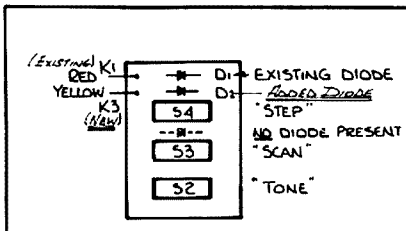


Figure 2 — Switch Board.

Referring to Figure 2, it can be seen there are vacant holes for extra diodes; currently only "D1" is installed. The modification is simplicity itself. First, insert an extra diode (1N914 or similar) in the "D2" position. It faces the same way as "D1" does.

Next, take a short length of wire from the "free" end of the diode to any "K3" point. A suitable location is on the back of the memory switch; the yellow wire is a "K3" scan-line. See the circuit diagram in Figure 3.

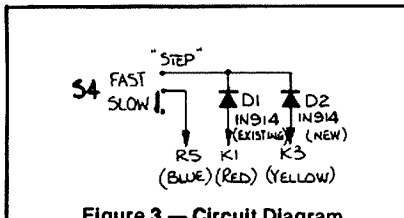


Figure 3 — Circuit Diagram.

Beware: the yellow wire on the switchboard is ***not*** a "K3" line. Also the circuit diagram has a mistake — the line shown as "K5" on the memory switch "SW1" is actually "K3" — the one we want.

With this being done, the unit may now be tested and then reassembled. The STEP switch will now give 25 kHz stepping when depressed, resulting in much quicker band-scanning and frequency selection. It will not increment the megahertz digit when stepping, but hopefully this will be the subject of a future article.

We have been unable to locate a schematic circuit for this transceiver, so we are unable to check all of the details — Tech Ed.

QSP

CORDLESS TELEPHONES

Some unapproved cordless telephones can cause harmonic interference, usually in the 3.500 MHz amateur band.

If you have such problems, identify the users name and telephone number by monitoring, then advise your state DOC office.

Prompt action is assured.

DC86 DIRECT CONVERSION RECEIVER

Novice Notes

FOR EIGHTY METRES

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

Last month, the principles of operation of a Direct Conversion (DC) receiver were outlined, with the promise of a construction article to follow. Following is the construction details.

PERFORMANCE

Frequency Range:
3.5 to 3.7 MHz.
Reception Modes:
CW, SSB, DSB, AM (as DSB) and RTTY.
Sensitivity:
0.4 μV for 10 dB S+N:N.
Selectivity:
50 dB down at 100 Hz, 45 dB down at 10 kHz.
Spurious Responses:
None.

This is not a simple "Mickey Mouse" project, but a serious attempt at a receiver of more than adequate performance. My guess is that the circuit is a little more complicated than expected. This is because satisfactory performance cannot be obtained with just the handful of components needed for a 'bare bones' DC receiver. Sure, we could hear signals on something made up of a dual-gate FET product detector, a one- transistor VFO and a high gain audio amplifier. Unfortunately, such a receiver would be sadly lacking on all points. I have made receivers like this, and they always prove disappointing. Strong signals 'swamp' smaller ones, the VFO pulls (varies in frequency) on strong signals, selectivity is poor, and hum can be a problem where mains wiring is nearby.

This project is based upon the receiver I described in *Amateur Radio* for March '84. As only one band is required in this instance, the design is greatly simplified by the omission of the frequency divider board. The audio board is used again here without change. In addition, factory-made printed wiring boards (PWBs) are available for this project, offering an added incentive to would-be constructors.

CIRCUIT

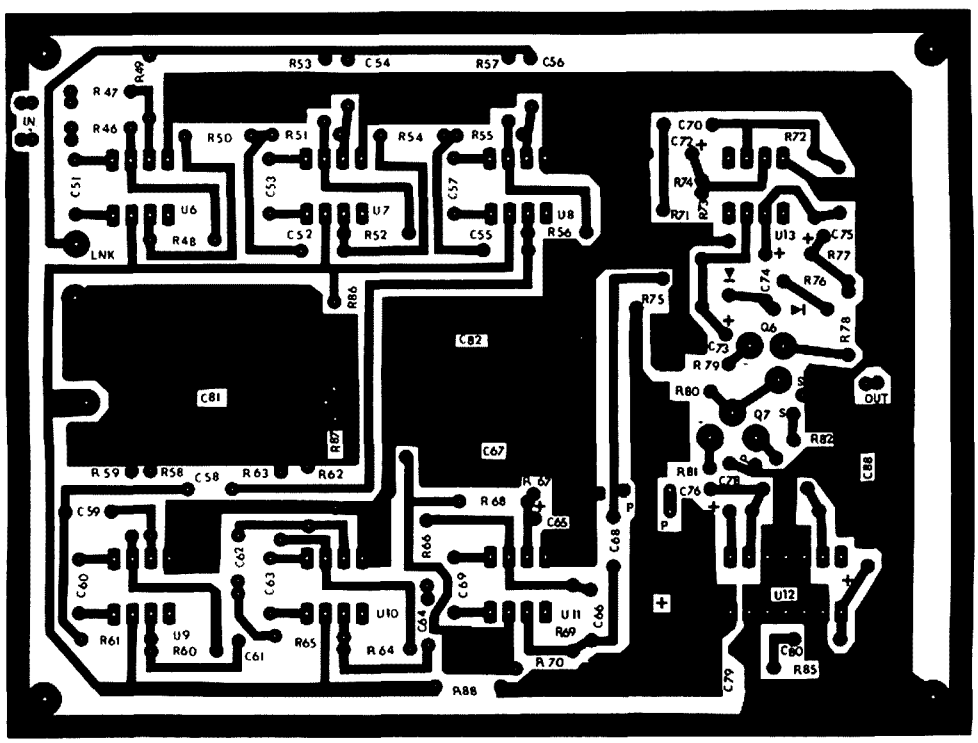
To prevent overload, only the band of interest; 3.5 to 3.7 MHz, should be presented to the input of the RF amplifier. L1 and L2, tuned by C1 and C3 form a top-coupled empirically designed band pass filter. An RF gain control R1 (an attenuator really) is provided so that overly powerful signals may be reduced to an acceptable level.

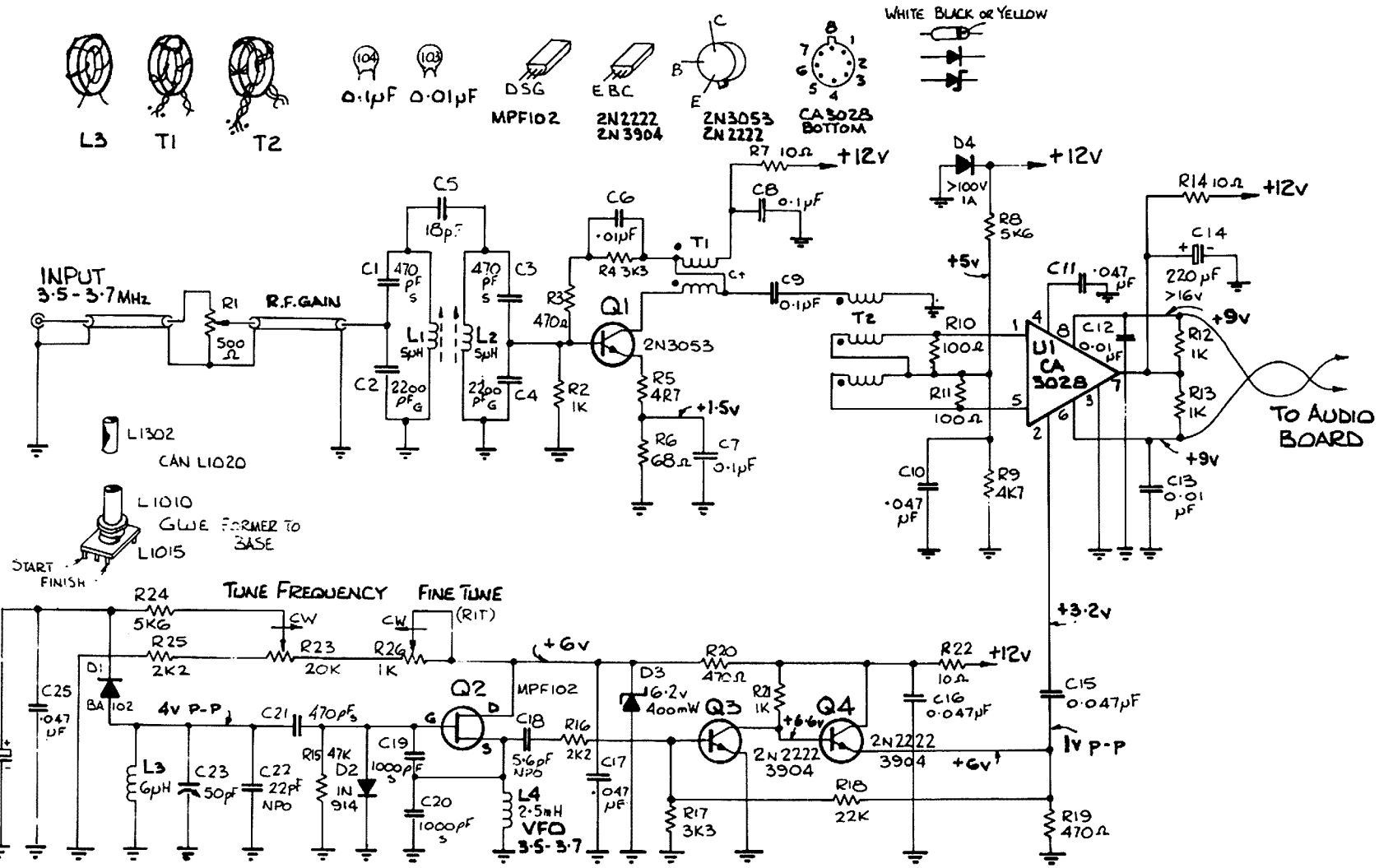
The broadband RF amplifier at Q1 is a popular favourite. This amplifier is a 'strong' one, with feedback and a hefty small-signal transistor (2N3053 or 2N5109, etc), not easily overloaded by strong signals. Such an amplifier would still be operating linearly long after a FET or dual-gate FET had reached its limit of linearity. About 10 dB of gain is provided. Noise performance is not particularly good, but on 80 metres, man-made and atmospheric noise will, in practice, obscure any noise contributed by this stage.

The active product detector is also a favourite. It is singly balanced, in that the input signal is applied to the differential input in push-pull at pins 1 and 5 of U1, a CA3028 current sourced differential pair, and VFO energy, at or near the frequency of the incoming signal is applied to the base of the current source transistor of U1 at pin 2. The sum and difference products are available at pins 6 and 8. R12 and R13 provide a balanced load, across which the difference frequency (audio) is established. The sum products; about 7 MHz, are suppressed by C12 and C13.

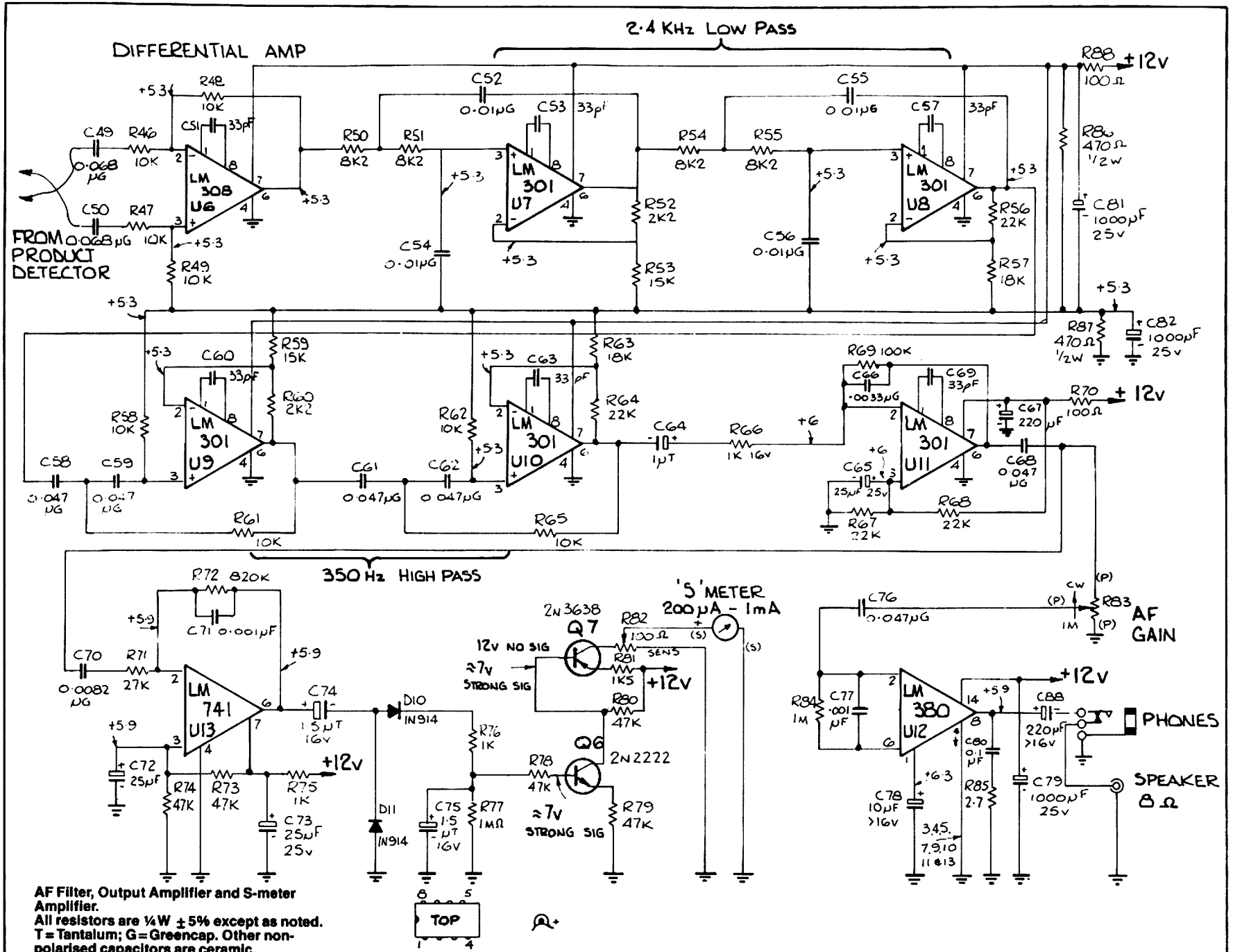
A Colpitts oscillator VFO at Q2 tunes from 3.5 to 3.7 MHz. As variable capacitors are becoming increasingly difficult to obtain, a common varicap diode, type BA102 at D1 is employed to vary the VFO frequency. The required capacitance variation, about 60 pF, is affected by R23 (course, or main tuning) and R26 (fine or RIT). So R23 yields about 200 kHz variation, and R26 about 4 kHz. A buffer amplifier at Q3/Q4 supplies about one volt p-p to U1, and isolates the oscillator from any load variations from the product detector — so reducing any frequency pulling effects from strong signals.

The component designations on the audio board derive from the '84 receiver. U6 functions as an interface between the differential output of the detector and the single ended input of the audio filter. It is at the same time a low impedance source for the input RC network at the input of U7. Detected signals are first applied to a 2.4 kHz low pass filter to remove all unwanted higher frequency products. The LPF is a fourth order Butterworth, with an attenuation at 10 kHz of 45 dB. This filter is followed by a fourth order 350 kHz high pass filter to remove unwanted lower frequency products. The HPF section has an attenuation of 50 dB at 100 Hz, so it is possible to resolve SSB, DSB, AM and CW signals with ease, because all redundant low frequencies are removed by the HPF Power line related noise (50, 100, 150 Hz, etc) is also greatly attenuated. By backing a LPF against a HPF in this manner, a band pass filter is formed. Ringing is not a problem, as each section of the filter is independent of the

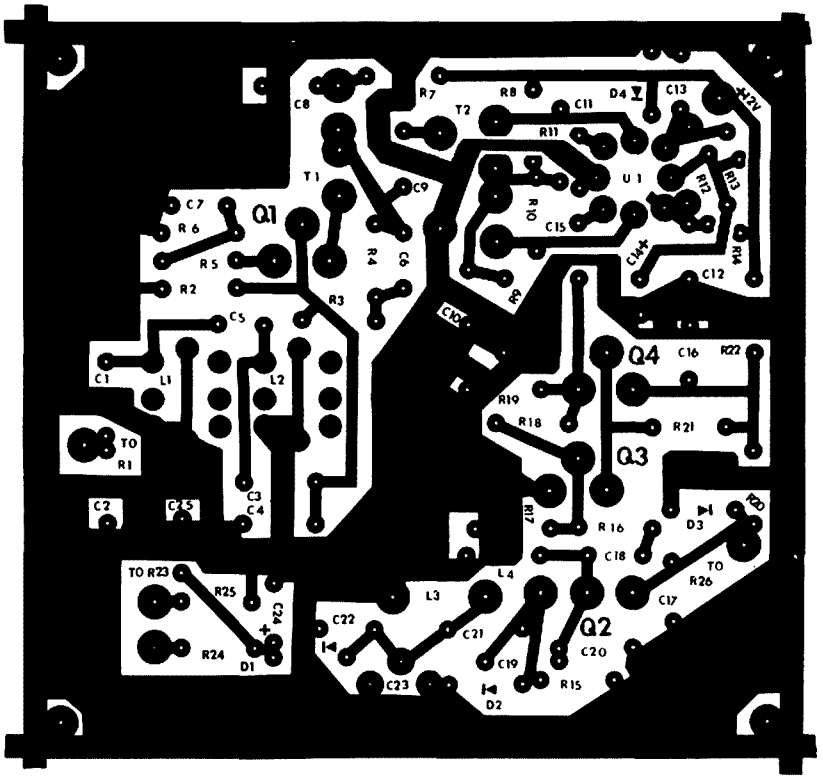




RF Amplifier, VFO, Product Detector.
L1, L2: 28 turns 26 B&S (0.32mm) enam on 5 mm former, F16 slug
T1: ≈ 13 loops 24 B&S (0.50 mm) enam twisted bifilar on Amidon FT50-43 toroidal core
T2: ≈ 11 loops 24 B&S (0.50 mm) enam twisted bifilar on Amidon FT50-43 toroidal core
L3: 32 turns 22 B&S (0.64 mm) enam on Amidon T68-2 toroidal core
S: Styroseal or poly
NPO: 'Negative-Positive-Zero'
G: Greencap Polyester
L4: RFC; 2.5 mH, DS P/N L1824



AF Filter, Output Amplifier and S-meter Amplifier.
All resistors are ¼W ±5% except as noted.
T = Tantalum; G = Greencap. Other non-polarised capacitors are ceramic.



others. R86/R87, bypassed by C81/C82 provide a centre reference to the plus and minus supplies for the op-amps in the audio filter.

The BPF is followed by an LM301 at U11 with a mid-range gain of about 40 dB, followed by an LM380 at U12 to adequately power speaker or 'phones. AF signal is picked off at the output of U11 and applied to the S-meter amplifier U13. The signal from U13 is rectified, and C75 is charged positively. The time constant of C75/R77 is chosen so that the S-meter reads an average value according to the strength of signal. Liberal decoupling is applied throughout the receiver to prevent instability.

CONSTRUCTION

All components are accommodated upon two PWBs; one for the RF amp/product detector/VFO, and another for the audio BPF/audio amp/S-meter amp. My receiver is assembled in a case measuring 255 x 77 x 155 (WHD) with a removable lid. No doubt the unit could be made much smaller than this. One approach could be to use one of those attractive plastic cases with a bail handle, intended for things like counters. The PWBs could be mounted back- to-back, with a panel between. These cases are fairly expensive however.

The power supply should not be built into the receiver. As can be imagined, with all that audio gain in there, to incorporate a mains power supply is asking for trouble. A suggested circuit is presented here a a guide. Information on power supplies abounds in technical literature, and need not be repeated here. The receiver will work quite happily *from* 9 volts to about 15 volts, and draws about 100 mA.

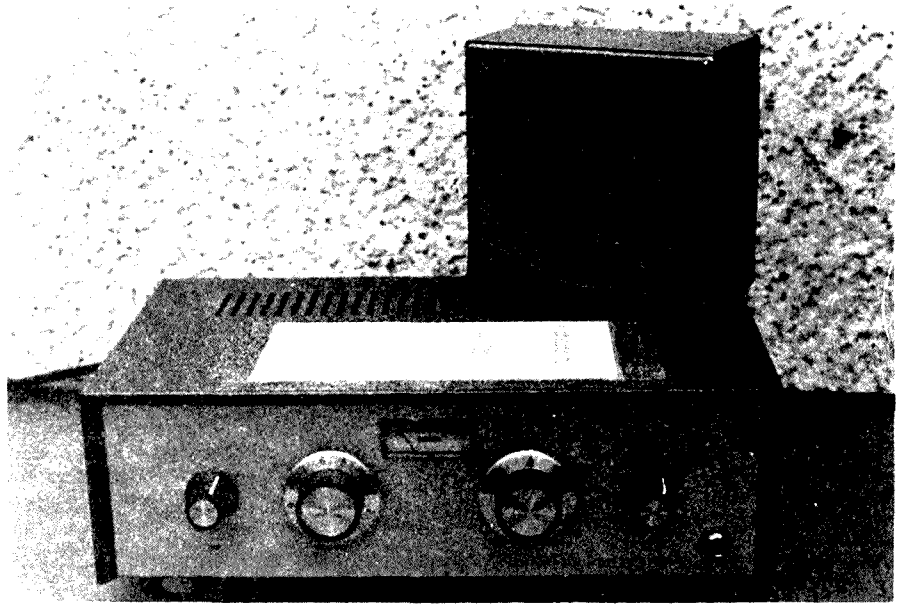
The speaker may be placed inside the case along with the receiver, but spurious resonances and rattles could be a problem. An external speaker gives a much cleaner sound, and this is strongly recommended.

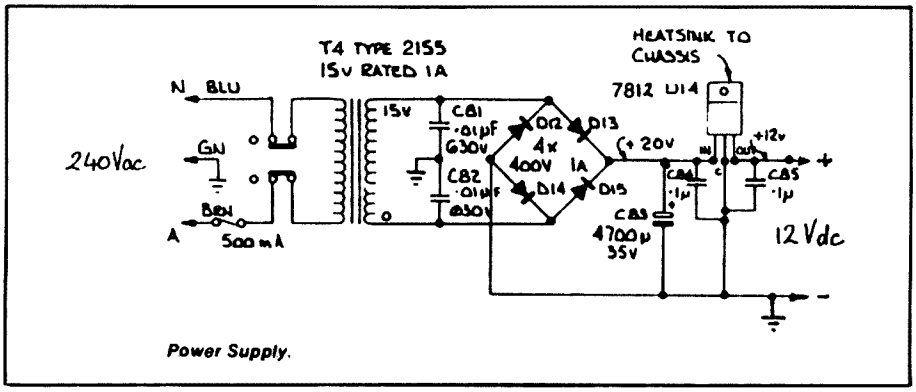
Some sort of readout for frequency will have to be provided. In the past, we would simply have bought one of those *Jabel* or *Eddystone* dials, but now mechanical dials have become horribly expensive and difficult to obtain. This was another factor which indicated the varicap and pot scheme. By using a pot for the tune control, we now get 270 degrees of rotation for our 200 kHz, against only 180 degrees for a variable capacitor. Let me indicate the perceived dial options:

- Two pots, the course pot fitted with a commonly available knob calibrated 0-10, and a lookup table or graph, as in the photograph.
- A 20k, 10-turn pot for R23 fitted with a turns counting dial and a table. This is a costly choice; pot about $10, dial about $30.
- Substitute a capacitor for D1, etc. A 100 pF variable in series with a 150 pF styroseal would be fine. If you have a nice capacitor/drive tucked away somewhere, then this could be just the time to hunt it out.
- Frequency counter. If you want a really classy readout, you could incorporate a frequency counter for the display. It must be well shielded of course. Sufficient signal level exists at the emitter of Q4 for this. *Radio Spares* have a 4-¾ digit counter module; P/N 258-D63 for about $75 if you are keen. Alternatively, if you already have a counter, simply extend the VFO signal to a panel mounted coaxial socket for the counter connection. Take care that there is not excessive 'kick-back' noise from the counter input.

The boards *may be* assembled *and* tested in stages. First perhaps, could be the audio board. If the S-meter is not required, all the components associated with this feature may be omitted; ie C70 through to R81. LM741s may be substituted for the 308 and 301s, but they are slightly noisier however. The 33 pF gain compensation capacitors must be left out if 741s are used. With this board assembled, and component locations/polarities checked; 12 volts may be applied. With the AF gain pot fully CW, a small amount of hiss should be heard. A screwdriver blade touched to either input at C49 or C50 should produce an audible buzz. If you want to test this board more fully, a small 2k:2k transformer (not critical) must be interposed between the balanced input and an unbalanced audio oscillator. Remember, the input is balanced, so any serious imbalance could cause the amplifier to oscillate.

Now the VFO, product detector and RF amp board may be assembled. Winding L1 and L2 could be a bit tricky if you have not wound small coils before. First, glue the L1010 formers to the L1015 bases. About 650 mm of 28 B&S enamel wire will be required for each coil. Solder the base end start of the coil into the pin corresponding to the earthy end of the coil (check the PWB), and anchor the free end of the wire *in* a vice. Screw the F16 slug about half-way into the top of the former. Keeping the wire taut; wind on 28 turns. You will find that the slug will now provide a convenient temporary tying off point for the end of the coil. Wind a good number of turns onto the slug so that they do not lose their tension. The coil must now be coated with some sort of enamel,





Power Supply.

such as nail polish, varnish or shellac to hold the turns in place. When dry, the top end finish may be soldered to the other pin.

T2 is made as follows:

Firstly, the Amidon cores must be coated with some lacquer such as mentioned earlier. This will reduce the possibility of shorts occurring should the wire enamel be scratched during the winding process. Take three 300 mm lengths of 24 B&S enamel wire. Lay them parallel to each other, and twist them together at one end. Clamp this end in a vice. Draw a cloth through the wires to remove any wrinkles. Now twist the free ends together and fix them in the chuck of a hand drill. Whilst keeping the wires taut; turn the drill until there are about three twists per cm. Give the drill a tug to set the twists, then remove the twisted group. Carefully thread the triplet onto your core until there are about 11 loops. Leave about two cm of wire at each end. Remove about one cm of enamel from each wire. With a multimeter set to ohms; locate the 'primary' winding (the one connected to C9). This gets two wires out of the way. Now, take any of the remaining wires and locate its opposite end. Do the same with the third winding. Now connect the start of the second winding to the end of the third winding to form the centre tap ct. Do not solder these, as a pad for each has been provided on the PWB.

T1 is made in a similar manner to T2, but without the primary winding. It is essential that the end of one winding is connected to the start of the other winding to form the centre tap ct. Winding starts are indicated schematically with a dot.

In the interest of frequency stability, styroseal or polystyrene and NPO capacitors must be used where specified. Ordinary ceramic capacitors have a lower Q, and a very poor capacitance versus temperature characteristic.

ALIGNMENT

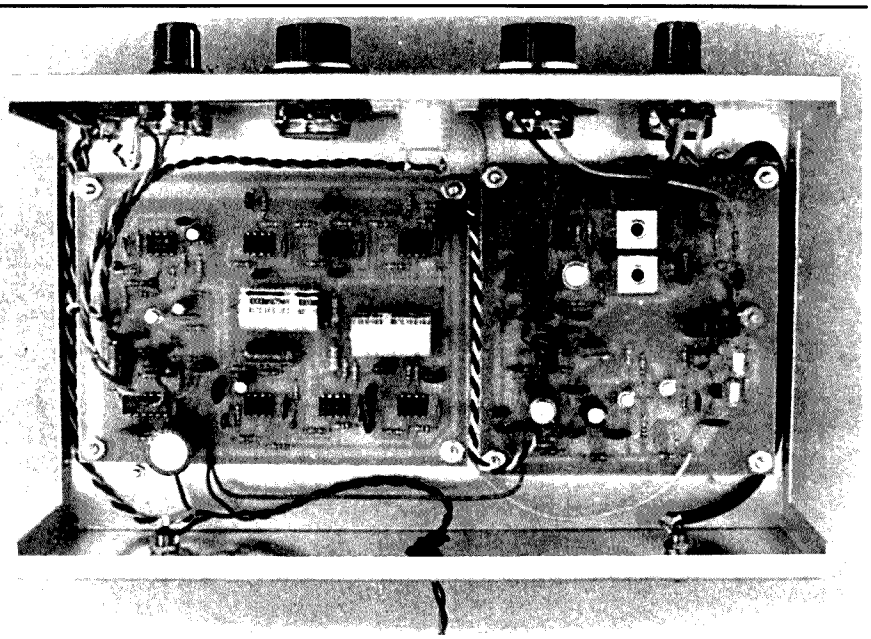
The VFO frequency must first be set. Three methods are available.

- Connect a frequency counter to the VFO output. Set R26 to mid- range, R23 CCW. Now adjust C23 so that about 3495 kHz is generated. Rotate R23 CW. The frequency should rise to about 3700 kHz. Check operation of R26; it should give about ±3 kHz of adjustment.
- Apply 3495 kHz from a signal generator to the input of the receiver. Set R26 mid-range, R23 CCW. Now adjust C23 until the signal is heard (the signal generator may have to be set to about 50 μV).
- Hook about 30 cm of wire (eg a clip lead) to the VFO output to act as a radiator. Set another nearby receiver to 3495 kHz. Set R26 mid-range, R23 CCW. Now adjust C23 until the VFO is heard on the other receiver.

If, for some reason, the VFO cannot be brought onto the correct frequency; the value of C22 may be altered. A 47 pF NPO would lower the frequency, removing C22 would raise it.

With the tuning range now established, we can now adjust L1/L2. Connect an antenna to the receiver input. Set R1 to minimum attenuation. Set the receive frequency to about 3.6 MHz and peak L1/L2 for maximum signal strengths. This should occur with the slugs well down into the coils.

The S-meter sensitivity pot, R82, may be adjusted when the receiver is up and going. It should be set so that the meter responds to reasonably weak signals, but at the same time does not pin violently when a strong station s tuned in.



TROUBLESHOOTING

Some key voltages are indicated on the circuit as a guide to troubleshooting should this be necessary. A high impedance volt-meter; eg DVM, must be used around the op-amps, otherwise errors will occur. A voltage which deviates by more than perhaps 10 percent from that shown would indicate a fault in that area.

An effect that had me puzzled for some time was instability in the audio section, manifest as a howl from the speaker as the AF gain control approached maximum. After checking for faulty by-pass capacitors, sources of imbalance and so on, suspicion fell upon the CA3028. Touching my soldering iron onto the can made the oscillation increase, whilst cooling it with *Freon* made it stop. I concluded that the CA3028 was indeed unbalanced. Replacing this IC cured the problem.

Please, if after fruitless attempts on your part you cannot locate a problem, write to me about it and I shall extend any reasonable amount of help necessary.

PARTS

Care has been taken to select parts which are, to my knowledge, readily obtainable. The only components which may be difficult for some are the toroids and the CA3028. These are available from *Ian J Truscott's Electronic World*, whose address is given below. The component parts of L1/L2 and the signal meter are available from *Dick Smith Electronics*. If you prefer to buy all your components from one source, a kit is available as follows:

Complete kit of parts, including PWBs: $95.00
Just 'Bare-Bones' — PWBs, toroids, all semiconductors: $52.00
Case (as in photograph): $15.70
(All prices include postage.

SUPPLIER

Ian J Truscott's Electronic World, 30 Lacey Street, Croydon, Vic. 3136.

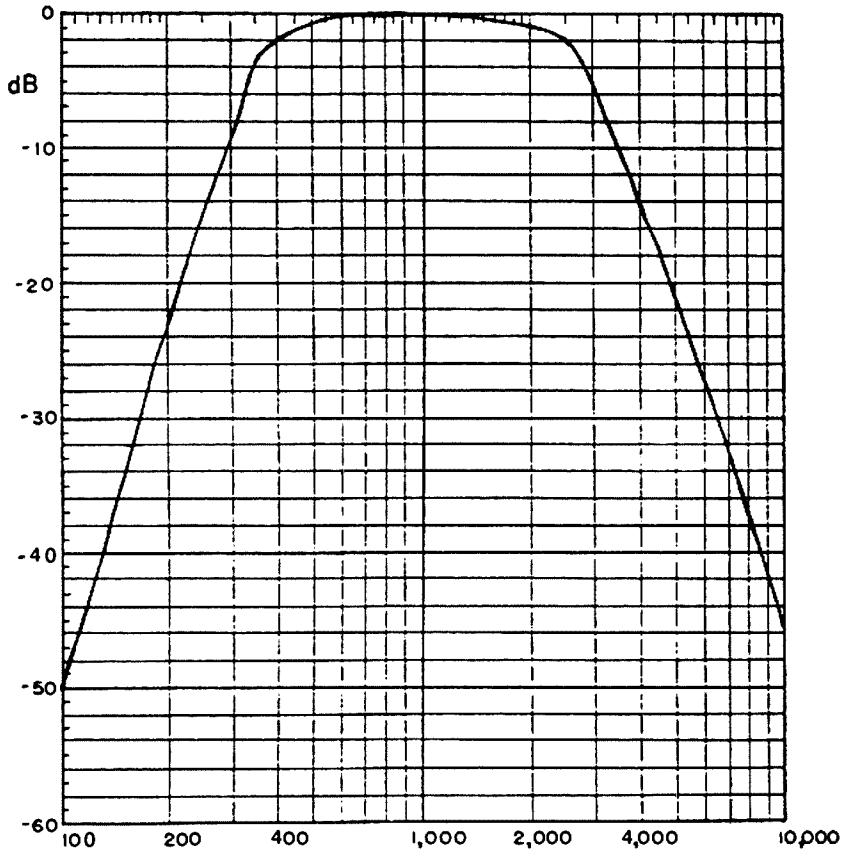
REFERENCES AND FURTHER READING

1. Solid State Design for the Radio Amateur — *ARRL*
2. Practical RF Design Manual — *DeMaw*
3. High Performance DC Receiver — *Diamond, VK3XU, AR, March '84*
4. The Design of Active Filters with Experiments — *H Berlin*
5. Direct Conversion CW Transceivers — *Price G4BWE, Rad Comm, Jan '86*

PARTS LIST

RF Amplifier/Product Detector/VFO Board

CAPACITORS	WHERE USED
5.6 pF, >25V, NPO disc ceramic	C18
18 pF >25V, NPO disc ceramic	C5
22 pF >25V, NPO disc ceramic	C22
50 or 60 pF trimming capacitor	C23
470 pF Styroseal/ Polystyrene	C1, C3, C21
1000 pF Styroseal/ Polystyrene	C19, C20
2200 pF Greencap/ Polyester	C2, C4
0.01 μF, >25V, disc ceramic	C6, C12, C13



Band Pass Filter Response

0.047 μF, >25V, disc ceramic	C10, C11, C15, C16, C17, C25
0.1 μF, >25V, disc ceramic	C7, C8, C9
4.7 μF, >16V, tag tantalum	C24
220 μF, >16V, PC mount	C14

RESISTORS	WHERE USED
4.7 ohm, ¼W, 5%	R5
10 ohm, ¼W, 5%	R7, R14, R22
68 ohm, ¼W, 5%	R6
100 ohm, ¼W, 5%	R10, R11
470 ohm, ¼W, 5%	R3, R19, R20
1 kohm, ¼W, 5%	R2, R12, R13, R21
2.2 kohm, ¼W, 5%	R16, R25
3.3 kohm, ¼W, 5%	R4, R17
4.7 kohm, ¼W, 5%	R9
5.6 kohm, ¼W, 5%	R8, R24
22 kohm, ¼W, 5%	R18
47 kohm, ¼W, 5%	R15
500 ohm linear (A) pot, ¼" shaft	R1
1 kohm linear (A) pot, ¼" shaft	R26
20 kohm linear (A) pot, ¼" shaft	R23

SEMICONDUCTORS	WHERE USED
2N3053/2N5109	Q1
2N2222/2N3904	Q3, Q4
MPF102/MPF103	Q2
CA3028A	U1
BA102	D1
1N914/1N4148	D2
6.2V, 400 mW zener	D3
>100V, 1A diode	D4

WOUND COMPONENTS

Former; 5 mm; DS P/N L1010	L1, L2
Slug; F16; DS P/N L1302	L1, L2
Base; DS P/N L1015	L1, L2
Can; DS P/N L1020	L1, L2
Toroidal Core; Amidon T68-2	L3
RF Choke; 2.5 mH, DS P/N L1824	L4
Toroidal Core; Amidon FT50-43	T1, T2
1m #22 B&S (0.64 mm) enam wire	L3
2m #24 B&S (0.5 mm) enam wire	T1, T2
2m #28 B&S (0.32 mm) enam wire	L1, L2

Audio Board

CAPACITORS

33 pF >25V disc ceramic	C51, C53, C57, C60, C63, C69
0.001 μF (1000 pF) >25V disc ceramic	C71, C77
0.0033 μF >25V disc ceramic	C66
0.0082 μF Greencap	C70
0.01 μF Greencap	C52, C54, C55, C56
0.047 μF Greencap	C58, C59, C61, C62, C68, C76
0 068 μF Greencap	C49, C50
0.1 μF >25V disc ceramic	C80
1 μF >16V tantalum	C64
1.5 μF >16V tantalum	C74, C75
10 μF >16V tantalum	C78
25 μF (or 22 μF) PC mount electrolytic	C65, C72, C73
220 μF >16V electrolytic	C67, C88
1000 μF 25V electrolytic	C81, C82
1000 μF 25V PC mount electrolytic	C79

RESISTORS

2.7 ohm ¼W 5%	R85
100 ohm ¼W 5%	R70, R88
100 ohm trimpot	R82
470 ohm ½W 5%	R86, R87
1 kohm ¼W 5%	R66, R75, R76
1.5 kohm ¼W 5%	R81
2.2 kohm ¼W 5%	R52, R60
8.2 kohm ¼W 5%	R50, R51, R54, R55
10 kohm ¼W 5%	R46, R47, R48, R49, R58, R61 R62, R65
15 kohm ¼W 5%	R53, R59
18 kohm ¼W 5%	R57, R63
22 kohm ¼W 5%	R56, R64, R67, R68
27 kohm ¼W 5%	R71
47 kohm ¼W 5%	R73, R74, R78, R79, R80
100 kohm ¼W 5%	R69
820 kohm ¼W 5%	R72
1 Mohm ¼W 5%	R77, R84
1 Mohm C taper pot	R83

SEMICONDUCTORS

1N914/1N4148	D10, D11
2N2222/2N3904	Q6
2N3638	Q7
LM308	U6
LM301	U7, U8, U9, U10, U11
LM741	U13
LM380	U12

Hardware

Case, 255 x 77 x 155, large knobs; one calibrated 0-10 (2 required), small knobs (2 required), signal meter; 250 μA; DS P/N Q2100, input connector, headphone socket, speaker socket, screws (8 required), nuts (8 required), spacers (8 required), hook-up wire, small 50 ohm coaxial cable (300 mm), (Speaker; not supplied in kit).

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"Two of your QRP friends to see you, dear . . ."

—Cartoon courtesy *The Short Wave Magazine*, March 1986

DOLLAR DECLINE — What it means

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

A look at the dramatic drop in the value of Australia's dollar, and its impact on amateur radio. Some of the people in the industry, which imports or makes equipment for radio amateurs and other communications/electronics enthusiasts, have been interviewed and their thoughts on the current economic situation give an up-to-date insight into the industry.

The newspaper headlines say it all — the bottom has fallen out of Australia's dollar on the foreign exchange markets. This has come about because, internationally, our dollar has been devalued, due to this country's balance of trade situation, rate of inflation, unemployment, level of overseas debts and other economic factors.

Most amateur radio equipment is imported from Japan and the dollar has taken a nosedive against the Japanese Yen, which is currently one of the world's strongest currencies. About 12 months ago, currency exchange was 160 Yen to the Australian dollar, but the exchange is now in the low 90s — a decline since January of about 35 percent.

A typical Japanese transceiver costing about $399 12 months ago, now sells for $649, a 60 percent increase, and industry sources predict further price increases.

The pricing structure which determines the retail price of equipment is too detailed to be fully explained in this article, however, there is a price chain before the consumer. This starts with the price of equipment in Japan, the freight to Australia, Customs Duty and Sales Tax. The retailer adds a mark-up to cover overheads — the level of which depends on various factors including competition in the marketplace and what the market can stand.

With landed prices so high, and rising because of the exchange problem profits are low and some retailers, who find themselves out of stock, are often unable to quote a firm price to the buyer. This is due to the unknown fortunes of the Australian dollar or whether there is a price rise just hours away.

DICK SMITH ELECTRONICS

The high price of new equipment is seeing a rival in home- building. Dick Smith Electronics (DSE) is one to move in and provide kits aimed at radio communication enthusiasts. DSE General Manager for Technical Products, Garry Crapp VK2YBX, says the situation "forces people back to building equipment."

The Company has produced a large number of kits over the past few years. There has been a string of 18 DSE kits including the VHF Commander transceiver, UHF Explorer transceiver, a HF transceiver, power meter kits for VHF and UHF, a direction finder, 100 watt linear amplifier, 13.8 volt 15 amp DC power supply preamplifiers, computer interfaces, frequency counters and antenna kits. Next will be a packet radio kit, combining the computers with amateur radio. Considerable savings can be made by the consumers constructing their own equipment.

DSE have evolved kits which require only a screwdriver and soldering iron. Garry says he is committed to seeing that kits are developed to meet the needs of enthusiasts. He says: "It's not a matter of saving money but of getting back to home-brewing."

He says this activity as far as amateur radio is concerned can be considered as a service rather than a business activity, at least during the present economic climate.

AMATEUR RADIO MAGAZINE KIT PROJECTS

Another success with kits has been the 80 metre transmitter by Drew Diamond VK3XU. The same is expected for the 3.5-3.7 MHz 80 metre direct conversion receiver described elsewhere in this magazine. These kits are available from Ian J Truscott's Electronic World.

The technician with this retailer, Ron Van Bremen says Drew approached Truscotts to see if they were interested in sourcing his transmitter kit and marketing it. The exercise has been successful so far with in excess of 50 kits being sold and mail order inquiries still arriving.

Mr Van Bremen says: "If the transmitter kit is any indication the receiver kit should take-off.

"The good thing about the transmitter kit is that you can get on the air with a few watts for about $25, if you provide your own case. The receiver kit is more complex and will be slightly dearer in price."

BAIL ELECTRONIC SERVICES

Bail Electronic Services has been an authorised agent for Yaesu equipment since 1963. This company spearheaded the importation of Japanese transceivers and other communications equipment into Australia and was successfully run by the Bail brothers, Fred and Jim, until 1979.

Known as "Bails," it was sold to Stan Roberts VK3BSR, after the death of Fred Bail.

Stan, a radio amateur for 38 years, has spent all his life in communications, including being a PMG engineer. He runs the importing and servicing business from Wangaratta in north-east Victoria.

Commenting on the exchange rate problem, he says: "It's virtually doubled the price of equipment over the past 18 months. It's obviously had an effect — I don't know what I should order because people can't afford the new prices."

Stan says, for example, that the last time he advertised the FT-980 late last year, it was selling for around $1900-1950. The same thing is now going to cost in excess of $4000. What radio amateur can afford that sort of money?

The downturn has forced him to retrench one technician in August.

Stan says what should concern people is, if the likes of Bail Electronic Services disappears from the amateur scene it will leave a hole in the availability of equipment maintenance.

Bails can be likened to the now extinct corner grocery store, where service and advice were paramount — totally different to the modern supermarket merchandising approach.

Bails has a good reputation throughout Australia and customers, both amateur and commercial, ship their equipment for service from all corners of the country.

EMTRONICS

The dollar crisis has meant an expansion of its manufacturing section for Emtronics, whilst still maintaining its import and retailing activities.

Company Director, Elizabeth Breznik, says she cannot predict anything but a further deterioration in the exchange rate for a short time to come. Despite the economy, she says the family business has had a "climbing upward trend in turnover — we've actually done better this year than last — close to a 30 percent increased turnover."

Elizabeth says: "The only way to do that is to work as a family — to give more than take — and if everyone in Australia did that things would improve."

This astute business woman is well aware of the Federal Government's current drive to boost Australia's exports and "Buy Australian" campaign because of the country's poor balance of trade situation. Perhaps Emtronics will catch this wave of patriotism which is likely to include some government assistance for those wanting to put Australian products into overseas markets.

Husband Rudi VK2AOT, also a Director, explains that Emtronics is making about nine products, aimed firstly at the Australian market, but with an eye on exports — including into the

Japanese market. These products include an antenna tuner and a cross-needle SWR/Power meter with built-in dummy load.

Rudi's found that when importing this equipment it is too expensive and people won't buy it. A popular imported cross-needle SWR meter now costs about $250 retail in Australia.

Emtronics are starting to make beam antennas and are gearing up for mass production with the aim of exporting most of them to Japan.

Other equipment manufactured by the company include linear amplifiers and regulated DC power supplies. It has already received inquiries from overseas for this equipment.

After business hours, Rudi is concentrating on product design and is convinced there is no need to have a factory to produce equipment. He says that during his buying visits to Japan for the company, he has had a good look at how electronic goods are made in that country. He is now training and sub-contracting people to mimic the "Japanese kitchen industry where sub-contractors get paid for every piece — that is the only way we can compete."

To strictly maintain quality control, every item from the subcontractor will be tested in Emtronics workshops before being sold.

ICOM

Kyoshi Fukushima VK3BZX, Managing Director of Icom Australia, says that, while there is a depressed market for amateur radio equipment, the company has maintained its prices structure since January, as radio amateurs cannot afford the higher prices.

Icom Australia has been operating for about four years and is owned by Icom Incorporated of Japan. Kyoshi says Icom equipment in Australia sells at retail prices "even lower than in Japan."

He says: "We want to keep the price as low as we can — and compete with more features in our equipment. Consumers can shop around and look for quality — it's not only price, but a quality product with more features.

"Icom engineering people are putting a lot of care and effort into keeping costs low — designing with more components to make simple, reliable and better performing equipment in many aspects."

Icom Australia has supported its amateur radio equipment prices through the sale of marine and land mobile equipment, but obviously prices will have to rise in the near future.

KENWOOD

Kenwood Australia, owned by the Trio-Kenwood Corporation of Japan, is in a similar position. National Sales Manager, Sandy Bruce-Smith VK2AD, says Kenwood's turnover has increased dramatically since it stabilised the price of amateur radio equipment since January.

Sandy says: "We're riding it as long as we can, but we have to remain profitable."

He cites prices in Australia as being very competitive with those in Japan. For example, to buy one TS-440 transceiver in Japan and bring it into Australia would cost $1800-$1900. This unit is available in Australia through Kenwood for $1585.

KCC

KCC is a Sydney-based company run by Kay Bruce-Smith, Sandy's wife, and is making inroads into ancillary communications equipment such as dip meters, noise bridges, receiving antenna tuners and line filters.

Kay says the company, which started four years ago, is exporting mainly to the South Pacific. The dip meter is all-Australian except for about three components — a variable capacitor and two transistors.

She says: "Radio amateurs are realising that decent equipment can be made in Australia."

But to produce equipment with intricate moulding and complexity requires a high turnover — so the Japanese, already tooled up for this, will continue their hold on the electronics market.

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Commemorative Transmission Marks A CLIMBING OF MOUNT EVEREST IN THE ELECTRONICS FIELD

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

The 80th anniversary of Australia's first land wireless broadcast was commemorated by radio amateurs in Victoria and Tasmania.

At 1 pm on July 12, 1906, the first message was transmitted by wireless telegraphy between Queenscliff, Victoria, and Devonport, Tasmania. This was a communication milestone which bridged Bass Strait to link Tasmania with the mainland.

Exactly 80-years later, Alf Forster VK3AJF and Russell Walker VK3CM, of the Geelong Amateur Radio Club (GARC) huddled in a tent at Golightly Park to communicate with Jim Davis VK7OW, a former WIA north-west branch historian, at Devonport.

It took the GARC team about 60 minutes to set up their station for the prearranged sched on 3.610 MHz. Russell said the anniversary was mentioned at a GARC general meeting and most local radio amateurs were not aware of the historic experiments carried out by the Marconi Company in their local area. He said the site, which was now a football oval, there is a granite cairn which gives details of the first communication in 1906, and lists those who were present. The timber building, used then, has been removed and is now in a state of disrepair on a nearby farm.

During the commemorative transmission, Jim read an old newspaper report which said that greetings were exchanged between the Governor General of Australia and the Governor of Tasmania. He had taken a keen historical interest in the first transmission and explained how the occasion resulted in a half-day public holiday.

"Bookmakers took bets that the signal would not come through," Jim said.

There is a cairn at East Devonport to mark the historic spot, and Jim has pictures of the building used for the transmission.

The Marconi Company wanted to sell wireless equipment to the Australian Government and sent engineers to Queenscliff and Devonport to conduct the experiment.

Russell said: "The Marconi Company showed great initiative to spend money and come out to do the experiments.

"It was, of course, a commercial exercise — I think they knew it would work and it wasn't so much an experiment."

He had read up on the event and talked to others about the type of spark equipment and size of antennas used for the transmission. "It was really the pioneering days — a climbing of Mount Everest in the electronics field.

"Experts travelling from the United Kingdom to set up the massive antennas and complex equipment would have cost hundreds of pounds," Russell said. Taking part in the commemorative event made him feel a bond with the wireless pioneers. He felt an increased awareness of the difficulties they had, not only technically, but in convincing others that wireless telegraphy would work.

He said:"Commemorating the transmission was a worthwhile experience and helped make young people aware of the pioneering days."

After the initial commemorative transmission contact, about 18 other stations joined the event.

The WIA 75th Anniversary had stirred many into thinking about the history of our hobby and radio communication. But the 80th anniversary crept up on the GARC, leaving the club with little preparation time.

Russell said he hoped the century of the first land wireless broadcast on July 12, 2006, was "a truer re-enactment" with the involvement of dignitaries. "It would be good to have dignitaries involved — it could make the whole thing more important to the general public."

The 38-year-old said he would like to be at the century commemoration, but considered younger radio amateurs of that time should run the show so they can feel the same bond with the pioneering spirit and carry on the tradition.

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Alf VK3AJF (left) and Russell VK3CM, in contact with Jim VK7OW, for a commemorative transmission to mark the 80th anniversary of Australia's first land wireless broadcast.

Photograph courtesy *The Geelong Advertiser*

QSP

UP, UP AND AWAY!

JAS-1 was launched on August 12, 1986 at 2045 UTC from Tanega- shima Island, along with two other satellites.

JAS-1 was heard on its first orbit over Australia with the beacon on 435.795 MHz. The orbit duration was 120 minutes, typical fast time 20-25 minutes.

Australian amateurs conducted two-way communications using voice on the first day of orbit.

Field Aligned Irregularity (FAI)

This article originates from HB9QQ and was published in Electron *June 1986. It was translated for AR by John Aarsse VK4QA. (Electron is the official journal of VERON).*

During the last few years, various publications have hinted the probable existence f new, and until now, little known or unknown propagation modes on two metres.

As the title indicates, it will deal with a phenomenon caused by the irregularities in the earth's magnetism.

This article will attempt to steer these unknown, but very interesting propagation modes into practical realities.

It is possible that interested amateurs will be able, with minor modifications to their equipment, to make FAI-DX QSOs on 144 MHz. The following information will make It possible for amateurs to recognise the phenomenon and thus be able to conduct a reasonable DX QSO.

PHYSICS BACKGROUND

FAI contacts use a special type of reflecting or bending medium, similar to Sporadic E contacts. The difference is that the medium can be imagined not to be a flat surface, but more as a snake-like pattern along the magnetic force lines.

Experience so far indicates beyond doubt that FAI Is concurrent with a given Es situation.

The propagation mechanism can be imagined as an ionisation along the magnetic field lines about 100 kilometres above the earth. The 144 MHz signals are transmitted into the FAI zone and then are "bounced-off" in a very particular angle to the field lines. This area is known as the "scattering area."

Further, it is known that FAI contacts in southern Europe (equal to approximately south Queensland/northern New South Wales) are more prevalent than in northern Europe. As these phenomena are quite complex, no further discussion is possible within the scope of this article.

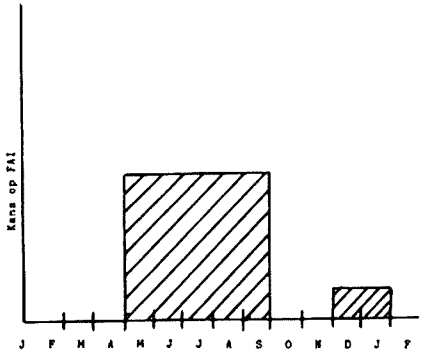

Figure 1 — FAI possibilities during the year.

FAI OPENINGS

As stated earlier, FAI openings are usually possible whenever there are Es possibilities. Figure 1 shows during which seasons it is possible to encounter FAI contacts in the Northern Hemisphere. A similarity with the Es season is evident. But FAI contacts are possible when there are no Es possibilities. Further, FAI contacts were observed after an Es opening.

Because of the fact that so far very few reports have come in about FAI openings, it is not yet possible to give reasonably accurate predictions as to which season is the best. Indications are that May until the end of September appear to be the most productive in the Northern Hemisphere.

Smaller possibilities in December and January have also been observed. But it is clear that FAI contacts should be possible when no Es is recognisable on 144 MHz.

TIME OF FAI

Nearly all known FAI contacts were made between approximately 1700 and 2400 UTC, with a maximum between 2000 and 2400 UTC. (See Figure 2).

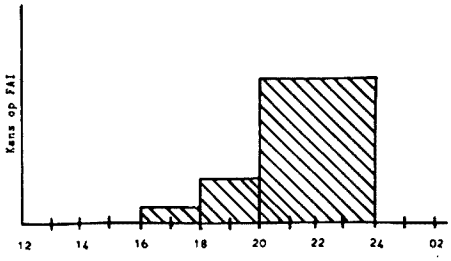

Figure 2 — FAI possibilities time-wise.

CHECKS

To have probable FAI possibilities, Sporadic E propagation should be possible, for instance on 50 MHz. To check for Sporadic E, the following procedures are possible:

— check the 28 MHz band
— check the television channels (48-54 MHz)
— check the east European 70 MHz broadcast band

If, for instance, strong 28 MHz signals are coming from Rumania (YO), one can assume that the FAI "incoming" area is in locator JN 66 (approximately Longitude 12.8 degrees east, Latitude 46.5 degrees north).

If 28 MHz signals are audible from the Crimea, KN 75 (approximately Longitude 34.8 degrees east, Latitude 45.56 degrees north) and one also hears the 70 MHz broadcasts, then one can assume that the FAI entry is around JN 97 (near Budapest). Here again, the positional longitude and latitude of the FAI zone can be decided. In any case, both stations must direct the signals towards the FAI zone and not towards the other station. Further, it should be noted that the reflection is not linear, but follows a half-circle path south of the FAI zone. This small zone is shown by the broken line in Figure 3.

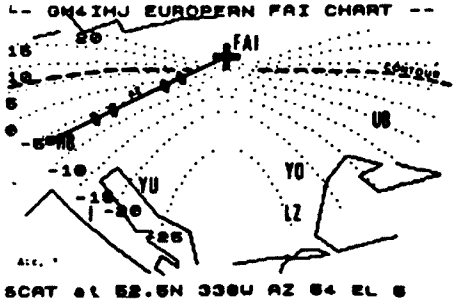

Figure 3 — FAI Zone Format.

The same illustration shows that with a fixed antenna direction of 54 degrees the following contacts are possible: ON, Central Germany, West Poland, UC and UA. It must be understood that the FAI zone position can shift and thus the antenna must follow this direction.

From this example it is clear that FAI propagation is completely different to Es propagation. The most important question is how one has to determine the antenna position in elevation and azimuth.

This information can be evaluated by pinpointing the FAI zone as exactly as possible. This position can then be fed into a computer and the angle can then be shown graphically. (See Figures 3, 4 and 5).

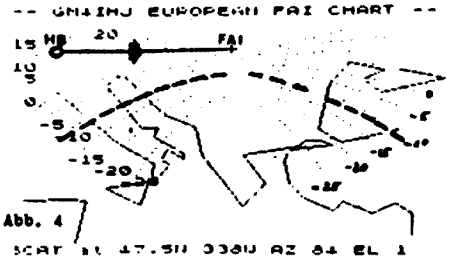

Figure 4 — FAI scatter at 47.5N and 22E (locator KN07XN). Transmitting station located along line +11 and QSO possibilities with stations along line -11. Azimuth 084 Elevation 1.

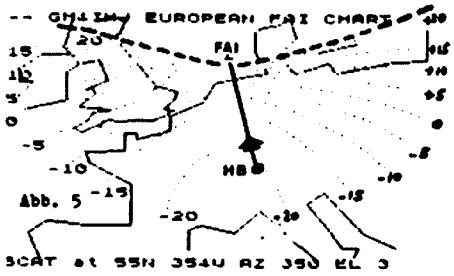

Figure 5 — FAI Scatter at 55N and 6E, locator JO35AA. Transmitting station along lina -21 Possibilities with stations along line +21 (GM, OZ, UG).

TECHNIQUES

Experiences so far Indicate that a minimal station concept is necessary to achieve representative results. Very important is a relative large antenna system to accurately determine the position of the FAI zone. An excellent array would be a 4 x 11 stacked array. Further, it is essential that the elevation is adjustable. Nearly all the usual receiver preamplifiers are good enough to get a reasonable sensitivity, while about 250 watts on the transmitter side should be sufficient.

OPERATIONS

Usually, FAI signals are very weak and often have a typical sound in the form of flutter or noise, similar to Aurora signals but not as deeply modulated. Because of these problems, most FAI contacts are made on CW. The difference between FAI and Es signals is that FAI signals are usually very weak but are more constant than Es signals.

CONTACT PROCEDURES

It is beyond doubt that FAI is a very interesting propagation mode. The reason why FAI contacts are not too successful up until now is probably due to the lack of specialist experiments in these areas. Also, there is hardly any communication and co-ordination between those interested in FAI in Europe. As a result of this article it is hoped that FAI becomes better known and a start can be made to systematically research FAI as follows:

a) As from April this year, a start was made of systematic tests in certain areas; eg G, EA, F, DL, I, HB, YU, HG, YO, LZ.

Any predictions of FAI propagation will be announced on any of these frequencies: 28.885, 14.345, 3.645 and 144.470 MHz.

b) The proposed times to test FAI openings are suggested to be on the full hour (h+00) and half-hour (h+30), the reason being that it will be impossible to search for a whole hour with the utmost of concentration for very weak signals.

c) For instance, FAI tests can take place on CW between 144.025 and 144.035 MHz and on SSB between 144.150 and 144.160 MHz. The reason for this selection is, that between 144.025 and 144.035 MHz, which is adjacent to the EME segment, hardly any CW traffic occurs. A segment

of maximum 10 kHz width should make it easier to search for active FAI stations.
d) FAI CQ calling is proposed to be done thus:
. . . CQF CQF CQF de HB9QQ, HB9QQ . . . The reason for this method is that it will make it clear that it is a FAI test CQ. This procedure is also used with Aurora tests, CQA has been used very successfully.
e) FAI reports to contain the following information:
. . . de HB9QQ RPRT 54F QTF 080 EL 12 . . .
A report indicated with the letter F ensures that the other station realises the FAI mode of propagation. The other information is very important for final correlation of good FAI zones.

REPORTING FAI CONTACTS

All reports and results of experiences with FAI should be sent to a central point. How this is to be regulated is presently very vague. It is proposed that, initially, national organisations collect the data until such time as a permanent IARU Region 1 co-ordinator is appointed.

CONCLUSION

This article has been presented in the interest of serious experimenters and researchers. It does not profess to be complete and/or totally correct. Anyone genuinely interested in FAI is asked to contact Pierre Pasteur HB9QQ, Sunnhaldenstr 28 A, CH-8600 Duebendorf, who, while writing this article, acknowledges with appreciation assistance from John GM4IHJ.

—Reprinted from *VERON* June 1986 and translated by John Aarsse VK4QA

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QSP

NEW RADIO BAND

Commercial and private users of radio in Australia are now being offered a relatively new VHF band. The Department of Communications released the 40 MHz band last year and it is permitting repeater stations.

Companies selling transceivers for this band claim that its ground wave propagation make it superior to the higher VHF bands in rugged and hilly terrain.

COMPUTER EDUCATION

Over the next four years the Victorian Government anticipates spending $20 million developing computer education in state schools.

The allocation will ensure that computer technology is made available to all primary and post-primary students in Victoria.

Computer education is now a major education priority as familiarity with computer technology will greatly enhance young people's future.

Power Supply for a VIC-20 Computer

Keith Rehe VK4AIO
7 Guardsman Avenue, Alexander Hills, Qld. 4161

An alternative power supply for the Vic-20 is constructed thus . . .

Being a user of a Vic-20 computer, like many others I expect, I am having power supply trouble. My supply has always got hot but this time it stopped completely (gave up the ghost).

This particular unit requires nine volts AC and five volts DC.

An alternative supply was constructed in the following manner.

Using an old electric blanket transformer, I removed several turns from the secondary winding to give exactly nine volts AC.

The regulator board was removed from the original Vic-20 supply and installed inside the transformer control unit.

The offending component (the regulator) is encapsulated in epoxy resin and can be unsoldered and left behind. Replace the regulator with a 7805 and use a ***very good heat sink.***

Connect nine volts AC to the board and use the existing power supply to computer lead (removed with the board from the old Vic-20 supply). Bridge the 2.2 ohm resistor and remove the 1k resistor.

The constructed unit, not being enclosed in epoxy does not get so hot and should last longer.

At least it will be easier to service in future!

No originality can be claimed for the circuit . . . just the idea!

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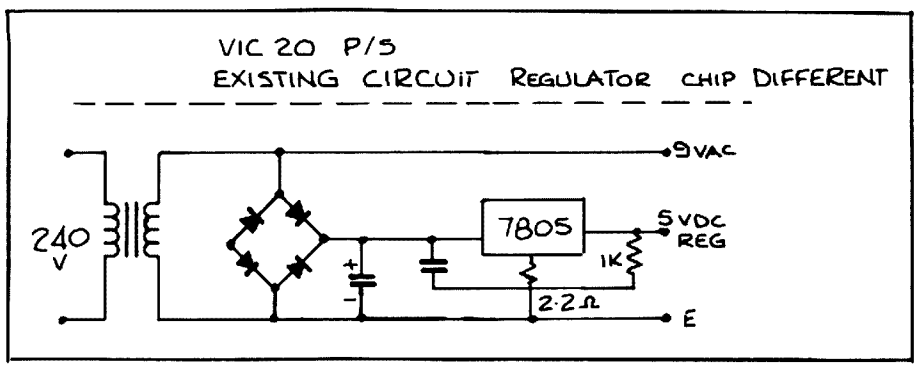

Figure 1 — The Vic-20 Existing Power Supply Circuit (regulator chip different).
Bridge is a 2.2 ohm resistor
Remove the 1k resistor
Use a good Heat Sink

IT TOOK OSCAR TO INTRODUCE US to the world!

Technology in communications has advanced so rapidly that we now rarely give a second thought to live telecasts from overseas. The same technology has revolutionised radio communications and Joe Ellis VK4AGL, of the Sunshine Coast Amateur Radio Club, says amateurs have spoken on their sets to people up to 39 000 kilometres away. Joe, in the following article which was published in *NEWS PLUS*, traces advances in radio communication over the past 30 years.

At 10 pm in October 1957, near the village of Tyuratum, 240 kilometres north-east of the Sea of Aral, a Russian rocket blasted off into space carrying *Sputnik One*.

Shortly after midnight a BBC radio operator at a monitoring station near London noted an unfamiliar beep-beep-beep signal.

Direction-finding equipment showed the direction changing rapidly. Only one conclusion was possible, that the signal was coming from an artificial space satellite. The space age had begun.

In the mid-1940s, long before this event, it was well-known that satellite relay stations could enable earth stations to communicate over large distances.

Other space techniques were already being prudently investigated at this time. *Project Echo* involved placing large 30 to 40 metre aluminised balloons into orbit. *Project West Ford* was an attempt to create an artificial reflecting band around the earth by injecting hundreds of millions of copper needles into space.

It is a matter of history that the United States abandoned these efforts and followed the Russian's Sputnik a few months later with *Explorer One*.

The radio signals from *Sputnik* were so loud that thousands of amateur radio operators and shortwave listeners were able to hear the spacecraft. The world responded with surprise and elation, according to newspaper reports of the day, to these wondrous events.

What was your reaction? I remember feeling a little uneasy by it all. Certainly I did not imagine that I would be talking to other parts of the planet via satellite from my own home in future years!

The story of amateur radio satellite operations began in 1959 when a group in the United States constructed a device and managed to get a free lift on a rocket which blasted off from Vandenberg Air Force Base late in 1961.

Orbiting satellites carrying amateur radio gave rise to the short term OSCAR. This was OSCAR One and it sent signals for 22 days before decaying and burning up in the earth's atmosphere.

OSCAR Five is of particular interest to Australians as it was designed and constructed by students at Melbourne University. The project was finalised in 1966. It had to wait four years before a free launch was negotiated on a NASA rocket in 1970. The first successful command of an amateur satellite took place on Orbit 61 of this Australian designed unit.

Another amateur device of interest is OSCAR Nine. Designed and built at the University of Surrey, UK, it was launched during 1981 into a low flying Polar orbit 544 kilometres above the earth. It is a scientific unit sending radio propagation details and other information.

Russian radio amateurs have also launched their own versions. Sputniks Three to Eight were all launched together into low altitude orbits and are solar powered.

The Japanese amateurs, who have assisted with the construction of previous OSCARS recently launched their own satellite, JAS-1.

There was excitement among the international radio operator community in 1983 when OSCAR 10 was launched via a European Space Agency rocket. A previous attempt to deploy an OSCAR 10 ended in disaster when the Ariane rocket blew-up after launch, dumping hundreds of volunteer hours of work into the Atlantic Ocean.

OSCAR 10 is operating in a high altitude Moiniya orbit. This enables us to communicate through this device for long periods without significant changes in the azimuth and elevation in our antenna system.

Designed for a life expectancy of seven to 10 years, it recently became affected by solar/cosmic radiation. For the technically minded, the satellite is of tristar construction and weighed 90 kilograms at launch.

President John F Kennedy said in a report to Congress in 1961: "I invite all nations to participate in a communications satellite system in the interest of world peace and closer brotherhood among the people of the world."

Some of the 16 000 amateur radio operators in Australia have taken up this challenge and are able to bypass censorship and Governments and directly communicate with other human beings on this planet, thus contributing to a more peaceful world.

—Reprinted from *News Plus* and contributed by John Aarsse VK4QA

1986 REMEMBRANCE DAY OPENING ADDRESS

Tape transcribed by:
Ron Fisher VK3OM

Profile researched by:
Ken McLachlan VK3AH

Every year the Remembrance Day Contest is preceded by a short opening address on all frequencies by a notable personality.

This year, it was thought fitting that, due to the 150th Anniversary Celebrations in South Australia, a well-known South Australian should present this address. No better choice could have been made than the notable Australian, Sir Mark Oliphant.

Before presenting Sir Mark's address, a little about this great man.

SIR MARK OLIPHANT

Marcus Laurence Elwin Oliphant, was born in Adelaide on October 8, 1901 and was educated at the Unley and Adelaide High Schools and later at the University of Adelaide, gaining an Exhibition of Distinction to enter Cambridge University. Here he obtained his PhD.

He gained employment at the famous Cavendish Laboratory under the eminent New Zealand atomic physicist, Lord Rutherford.

At the age of 34, he became the laboratory's assistant director of research and in 1937, accepted the position of Poynting professor of physics and head of the physics department at the University of Birmingham. In 1943, his secondment by the United States of America was approved, where he was to work with American scientists that developed the atomic bomb.

This gentleman was one of the team of scientists who discovered the 'deuterium reaction' that led to the development of the hydrogen bomb. During World War II he concentrated his abilities on the research of radar and atomic energy.

He has consistently opposed the use of nuclear weapons and one of his many philosophies which he quotes many times is "scientific discovery must be studied in relation to its use and misuse by mankind."

Sir Mark holds many degrees conferred by various universities. He has had notable employment both in Australia and overseas, some of the positions being Director of School of Research in Physical Sciences (1950-1963) and Professor of Physics of Ionised Gases at the Institute of Advanced Studies at the Australian National University (1964-1967).

Marcus Oliphant was knighted in 1959, at the age of 58, for his contributions to science.

In 1971, he was appointed Governor of South Australia, a position he held for five years. His popularity in that state was overwhelming due to his being a public spirited and free-speaking citizen.

Sir Mark Oliphant, AC, KBE, FRS, thank you for your participation in the 1986 Remembrance Day Contest.

THE 1986 REMEMBRANCE DAY OPENING ADDRESS

I am honoured to be asked to speak during this Remembrance Day Contest though I think that I belong to a generation which knew nothing of the techniques or achievements of radio as exists today.

When I was a youth, radio amateurs used spark transmitters, Morse code and crystal detectors. Such enthusiasts did not realise that they were pioneers of the solid-state electronics used by both professionals and amateurs now. I shall mention this again later.

In the laboratories of the Department of Physics of the University of Adelaide, we used crystal receivers to listen in earphones to the local radio station which transmitted time signals and Morse code messages to ships in the neighbourhood. Then just after the First World War, the first De Forest Audion valves were received. These little tubes contained gas, which glowed when in use, and the tungsten wire cathodes did not last long. Nevertheless, it was with one of these that I first heard music in earphones, which had been transmitted by an American ship then in port.

Professor Kerr Grant was away on study leave so he missed this thrilling experience. Shortly afterwards the hard vacuum three electrode valves appeared.

George Fuller, my fellow honours student, invested in a complicated six valve receiver with successive, separately tuned radio frequency amplification components, which had to be tuned by turning six separate knobs.

I wondered then, and I still wonder, how anybody ever had the patience to use such a device. In those days, there was no mention whatever of radio in the lecture given in the Department of Physics.

Although the electro-magnetic theory, that is Maxwells equation formed the backbone of part of the course.

When I left Cambridge in 1937 to become the Professor of Physics in Birmingham, the whole of the university, including the laboratories of the Physics Department, operated on direct current, which was generated in the Department of Mechanical Engineering, with reciprocating steam plant, so in the laboratories there were no experiments using alternating current and consequently, no electronics of any kind.

An honours graduate in physics at the end of his course knew nothing of electronics. We, who were senior members of the Cavendish Laboratories, where Appleton, Radcliffe and others had done historic work on the Heaviside layer of the upper atmosphere and used electronics extensively in their investigations, had been inducted into the secrets of radar before the war.

When war broke out, we were immediately assigned to war-work in that field. This was not a simple task in my physics department, where no electronics had been taught. The shortest wave length available using the vacuum valve known as the *Micro-pup* was about 50 cm. This was not suitable for air-borne radar. So I was assigned the problem of how to generate pulses of radio power with a wave length of 10 cm or less. Having visited the various manufacturers of radio valves, I decided that we needed a team of people able to think in terms of first principles, rather than the practice of radio as it was at that time.

It seemed clear to me that it was essential that the resonant circuit of the oscillator for these very short wave lengths must be an integral internal part of the system rather than external to an electronic valve the size which could never be reduced greatly and still give appreciable power.

So we began with a continuously evacuated klystron which produced about 600 watts of radio frequency power and gave good echoes from aircraft and ships.

Doctor Sayers was the keyman in that demonstration. The receiver was a silicon crystal which was used in a super heterodyne circuit, converting the radio frequency to that used for early British television, the circuitry for which was available commercially.

It was the diode to which Bell Telephone Laboratories added a third electrode and the transistor was born.

Meanwhile, Randell and Boot produced the concept of a ring of oscillatory circuits surrounding a cathode at the centre of a magnetic field, the so-called cavity magnetron. He and his colleague Boot developed this to give many kilowatts of radio frequency power in pulses at a wave length of 10 cm.

After some modification by Sayers, this became the standard technique in late wartime radar. It is ironic perhaps, that the greater use of the magnetron today is in the microwave oven.

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Photograph courtesy *The Advertiser, SA*

Sir Mark Oliphant being sketched by Kerrie Elliott.

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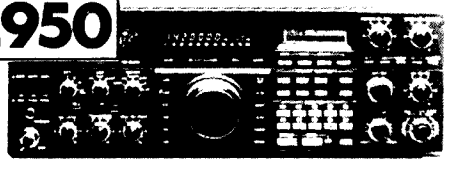

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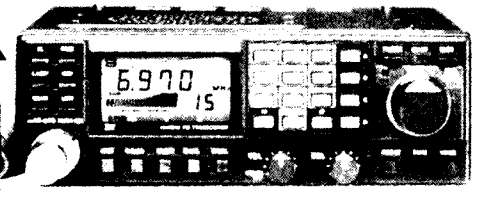

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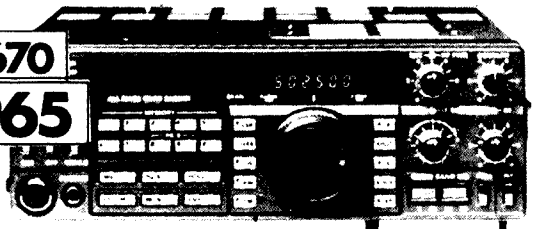

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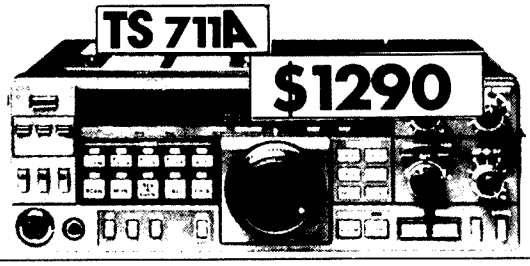

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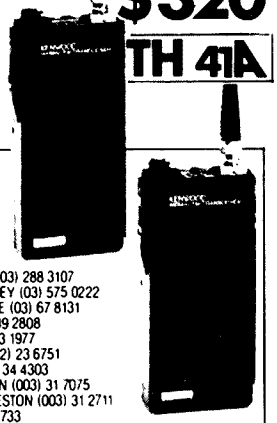

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THE COLLINS S LINE

The name Collins is synonymous with high quality communications equipment. It is also one of the oldest names in amateur radio's history of commercial equipment manufacturers. In pre-war days, Collins produced a series of amateur transmitters with power levels ranging from about 50 watts to a full one kilowatt input. At this time, Collins did not produce any amateur receiving sets and it was not until 1947 that they released their first receiver, the 75A.

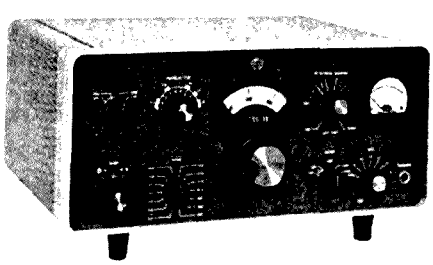
Its design was, for the time, radical to say the least, with crystal locked front end converters feeding a tunable IF It was this design that was to set new standards in stability and accurate frequency calibration.

Soon after this, Collins released their mechanical filter, which was able to produce a flat top, steep sided selectivity curve which was almost impossible to achieve with normal tuned circuits. These filters made the generation and reception of single sideband much simpler and effective. The last of the 75 series, the 75A4 Is still looked upon as a classic in the design of amateur SSB receivers, and it was released in 1955. Soon after this, Collins produced their first SSB transmitter, the KWS-1.

However, very few of these were ever imported into Australia due to rather stringent import restrictions that applied at that time and also, no doubt, to the very high price. In those days, the average Australian amateur thought himself very lucky if he owned a war disposals receiver such as an AR88 and either a modified surplus transmitter, or a home built unit, perhaps incorporating the latest Geloso VFO unit.

Collins produced the first amateur SSB transceiver in 1957, the KWM-1. This covered the 20, 15 and 10 metre bands with a pair of 6146 tubes in the final.

It was in 1959 that the Collins S-Line was released with the 75S receiver and 32S transmitter which were imported into Australia in small quantities.



THE COLLINS 75S RECEIVER

The 75S receiver was produced in two versions, the '1' and the '2'. These were double conversion designs with a tunable first IF at 3.155 to 2.955 MHz and the second IF at 455 kHz with a 2.1 kHz filter for SSB reception. All Collins receivers from the original 75A on used a permeability tuned VFO to give linear calibration and high stability. The amateur bands from 80 to 10 metres were covered in switchable 200 kHz segments with only one segment, 28.5 to 28.7 MHz supplied as standard on 10 metres.

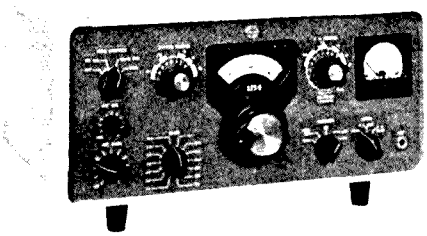
The all tube line up was 6DC6 RF stage, ½6U8 first mixer, ½6U8 second mixer, ½6U8 crystal oscillator, 6DC6 first IF, 6BA6 second IF, 6U8 product detector and BFO. 6AT6 AM detector, AGC detector and first audio, 6BF5 audio output, 6AU6 VFO and ½6U8 isolation amp. Two of the new silicon diodes were used as power supply rectifiers.

The main tuning dial was calibrated in one kilohertz divisions widely enough spaced to allow frequency to be read accurately down to about .25 kHz.

The 75S-2 was designed for extra frequency coverage with an additional 14 band positions. With the appropriate crystals installed it was possible to tune any frequency between 3.4 and 30 MHz. These receivers were built to the highest commercial standards and, in fact, probably more were used in commercial point-to-point services than were ever sold to amateurs.

The original price of the 75S-1/2 receiver is not known (perhaps someone can fill me in). Second-hand value is very dependent on condition. Older Collins receivers and transmitters are like Leica cameras — collectors items.

The 75S-1 in excellent condition is about $200 and the 75S-2 about $225.



THE COLLINS 32S TRANSMITTER

This is a matching transmitter for the 75S receiver described above. Almost identical in appearance to the receiver, the 32S used the same type of VFO and mechanical filter as the receiver. The final stage used a pair of 6146 tubes to give around 100 watts output. Collins were among the first to employ negative RF feedback across the final stages to reduce inter-modulation distortion. Japanese manufacturers did not discover this until Kenwood introduced it in the TS-820 some 18 years later! With the same VFO and IF set up, the transmitter and receiver could be coupled together to transceive. This worked very well compared to some of the early Japanese efforts which did not quite come-off. The 32S required a separate power supply with 800, 275 volt HT plus 6.3 volts AC and -60/80 volts bias.

The Collins 516F2 power supply met these requirements, but most of these operated from 115 volts AC only. Tube line up of the 32S transmitter consisted of 6U8s, 6DC6s, 12AT7s and a 6CL6 driving the two 6146s. The 32S-1 is the amateur band version while the 32S-2 has an additional 14 crystal positions for use on other required frequencies. Second-hand value today would be about $225 for the S-1 and $250 for the S-2.

The addition of a matching power supply would add about $75 to these prices but many of the transmitters in use here have home-made power supplies which might not be worth very much. Often this equipment is sold as a matched pair and this is certainly the best way to buy, although it is often cheaper to try and buy each unit separately.

THE COLLINS 75S-3/B/C

These are up-graded versions of the S-1/2 receivers, released about 1962. Additions to the earlier series included a most effective notch filter, a variable BFO for CW reception, an optional filter for CW and RTTY and selectable AGC decay time. Appearance is the same as the 75S-1/2 with the addition of a couple of control knobs. The B-model is the amateur band- only while the C has the additional crystal board. Price of these receivers when new (1972) was $1223 for the B and $1310 for the C. Second-hand value today would be about $300 for the B an $325 for the C.

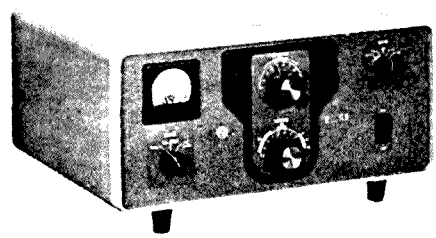
Collins enthusiastically identify early or late models of this series by the Collins badge above the dial which was changed from a winged to a round type badge about half-way through the production run. A round badge model will usually command a higher price.

THE COLLINS 32S-3 TRANSMITTER

The matching transmitter for the above receiver, is similar to the S-1 but again, upgraded in the following ways.

A CW spotting control to facilitate CW netting, and provision for RTTY operation. Many of the remarks on the 75S-3 receiver also apply to the transmitter.

The 32S-3A has the extra crystal board for extended frequency coverage. Second-hand value today would be about 325.



THE COLLINS 30L-1 LINEAR AMPLIFIER

This is the companion linear for the above receiver and transmitter combination. Also usable with the Collins KWM-2 transceiver to be covered in a later article.

Fully self-contained with power supply, the 30L-1 uses four 811A tubes in parallel. Rated at 1000 watts PEP input with 70 to 100 watts of drive, but actually capable of somewhat higher power. Power output 700 to 800 watts. This amplifier features the usual Collins superior design with negative RF feedback and automatic load control.

A very desirable linear for any amateur application. Price when new (1972) was $731 but today would be worth around $1000 if you can find one.

NEW ABC RADIO NETWORKS

FM transmitters at 42 sites in Queensland and Western Australia will begin broadcasting programs on the ABC's new Second Regional Radio Network in the first half of 1987.

The first phase of the new network, costing over $1.6 million, will benefit 40 000 people In Queensland and 17 000 in Western Australia.

Another 300 sites around Australia are to be included in the network over the next 10 years.

FIBRE OPTIC NETWORK

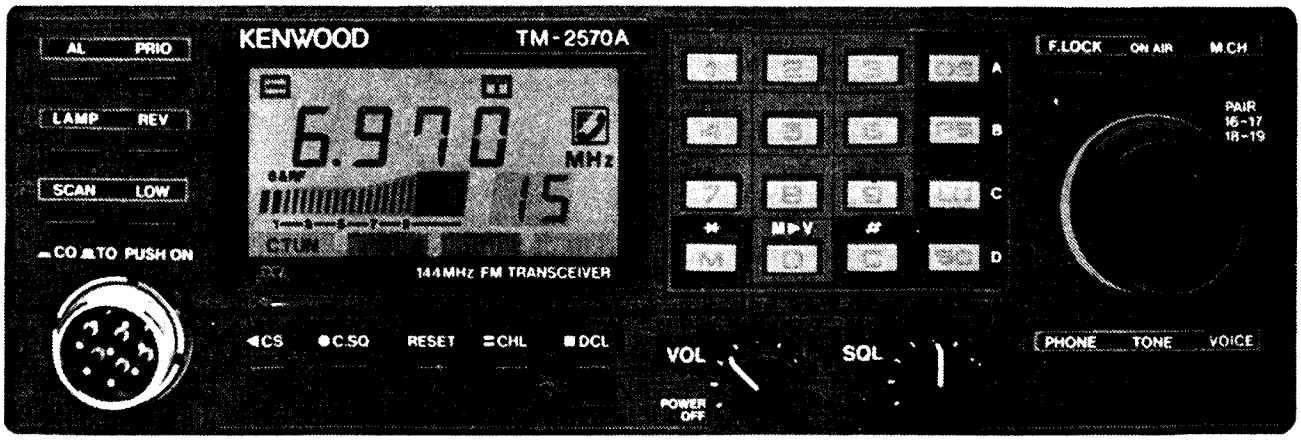
Telecom Australia plans to lay a 2 700 km optical fibre link between Perth and Adelaide by 1989. This is part of a national optical fibre program to connect all Australian mainland capital cities by 1992.

The Perth-Adelaide link will be the world's longest link without intermediate terminals.

Later links will be Adelaide-Darwin and Adelaide-Brisbane, with a spur line connection to Melbourne and Sydney.

A fibre optic loop for the Melbourne central business district is nearing completion and a similar loop is being considered for Sydney.

The optical fibre links consist of hair-thick strands of extremely pure glass and are capable of carrying all types of telecommunications traffic.



Equipment Review

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

THE KENWOOD TM-2550A/2570A TWO-METRE FM TRANSCEIVERS

These transceivers have been released as updated replacements of the TR-7950 series, two metre FM transceivers. The TR-7950 was reviewed in the July 1983 issue of *Amateur Radio*. The new transceivers retain all of the desirable features of the old models while introducing several updates that again put Kenwood into the lead with two metres FM. Perhaps the outstanding achievement is putting 70 watts output (the 2570A) into a mobile size package.

The TM-2550A is rated at 45 watts output which is the same as the original TR-7950. This review will concentrate on the higher powered model.

TM-2550A/2570A DESCRIPTION

These two metre FM transceivers have identical features except for the difference in power output. Because of this, the higher powered version is slightly larger because of the increased size of the final amplifier heat sink. Overall dimensions are 180 x 60 x 215 mm (WHD), for the 2550A, and 250 mm (D) for the 2570A. Weight is 2 and 2.35 kilograms respectively. In addition to the larger heat sink, the 70 watt model also has an in-built cooling fan which is thermostatically controlled.

Full coverage of the two metre band is provided in five kilohertz steps. Required frequencies are selected by entering them on the keyboard, then transferred to one of the memories. Memories are selected by the large right "tuning" knob. Any one of the memories can be designated a priority channel with the receiver sampling this every five seconds and sounding a loud double beep if the channel is active. Also, any of the memories can be selected to be skipped during the memory scan.

The LCD display has been greatly expanded on the new transceivers. The old TR-7950 used an LED S-meter and LEDs to indicate reverse repeater operation, the centre tuning indicator and the priority channel selection. These are now all incorporated into the LCD display.

The S-meter is particularly good with 24 calibration points as against only seven on the old 7950. Just how the S-meter actually works out in practice will be covered later in the test section. However, the greatest update in the new models is the list of options. As our review transceivers were not actually fitted with any of these, I can only describe them and then leave the choice to you.

First is an option that will be taken up by amateurs with impaired sight, the VS-1 voice synthesiser. At the touch of a button, this will announce the frequency, memory channel selected as well as information on the optional call systems possibly fitted.

Next, the MU-1 "Digital Channel Link System". This wondrous sounding gadget performs all sort of magic tricks, however, it is necessary to have two (or more) similarly equipped transceivers to make things work. Firstly, if it becomes necessary to change frequency, the DCL searches for a clear channel, then returns to the original channel and informs the other transceiver and they then both change to the new frequency, completely automatically. If the CD-10 call sign display unit is connected to the transceiver, stations who have called you will have their call signs displayed on the screen. I hope in the future to obtain a pair of the complete DCL plus call display units and actually try them out. If any readers have had experience with them, please let me know.

ON THE AIR

With a transmit current drain of 16 amps, a solid power supply is required. Kenwood recommend their PS-50, which is rated at 20 amps output. I used my Icom PS-15 and also Yaesu FP-707 power supplies and both supplied the required current with no trouble. The 2550A requires just under 10 amps on transmit, so a 10 amp supply should suffice so long as you keep your transmissions to reasonable length.

Selecting frequencies, repeater offset and then entering them into the memory is very easy. As each number or function is selected, a beep is heard to indicate that the command has been accepted.

Comprehensive scanning facilities are provided. The memory scan can be programmed to stop on a busy channel for either a preset time of up to about 10 seconds or at the conclusion of the transmission. Selected channels can be skipped during the scan by means of the "lockout" facility.

Two types of band scan are available. First, a full band scan and second a programmed scan. The upper and lower points of this are entered into memory 'd' and memory 'u'. Scanning direction can be reversed simply by pressing either the up or down buttons on the microphone. Scanning speed can be increased by holding these buttons down. Another of the nice features is the centre stop facility. This means that scanning will only stop when the signal is properly tuned onto the frequency.

One of the nice features on these new units is the rear illumination of the front panel. For night time mobile operation this certainly sets a new standard. All keyboard buttons and other control labels feature this in a translucent green — very nice!

Received audio quality from the larger-than-average internal speaker is quite good. The speaker is mounted in the top of the cabinet, good for mobile operation so long as it is not firing up into the underside of the dashboard. With a good quality external speaker, the received audio is exceptionally good.

Transmit audio was checked with two microphones, the supplied MC-42S hand- held with up/down scanning buttons and the MC-60A desk type. The hand-held produced crisp clear audio while the extended response of the MC-60 was reported as "broadcast quality." I am pleased to see that Kenwood have fitted a now-standard eight pin microphone connector which is compatible with other current models. The locally supplied earlier model, the TR-7950, had, for some reason, a six pin connector which caused many compatibility problems. Strangely though, the Trio model of the same transceiver had an eight pin connector.

Transmit tests were carried out over extended periods to check retention of output power. Many transceivers tested show a falling-off of power after a short time. Both of these transceivers delivered consistent power over several hours of testing.

Operation was also checked at supply voltages below 13.8 volts. Power output fell slowly down to about 10 volts and at this point, the 45 watt model was down to 20 watts, and the 70 watt unit was down to 35 watts. Below this voltage things died rather rapidly.

ON TEST

The following test equipment was used to produce the figures obtained during these tests.

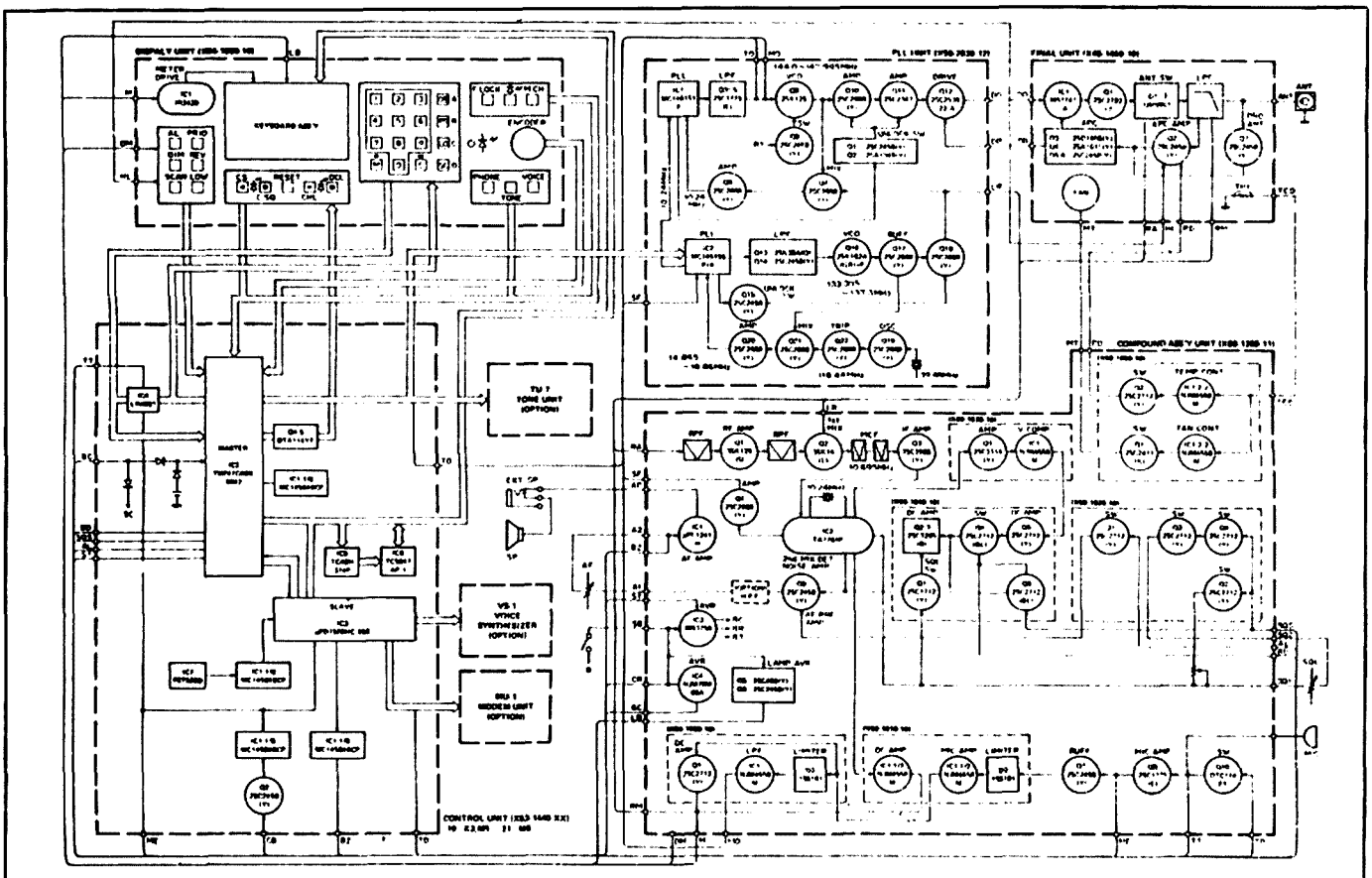
Yaesu YP-150 terminating RF power meter, Marconi TF-957/1 terminating RF power meter, Marconi TF-995A/5 signal generator, Daven audio power output meter, AWA F242A noise and distortion meter. All tests were carried out with a regulated 13.8 volts applied to the transceivers unless otherwise stated.

Transmit Power Output

The two transceivers were checked with the following results.

TM-2550A

POWER O/P HIGH	POWER O/P LOW
47 watts	4.5 watts
9.7 amps	3.2 amps



Block Diagram of the TM-2570A.

TM-2570A	
65 watts	4.7 watts
15.8 amps	3.3 amps

It is noted that the low power output setting is adjustable over a fairly wide range. The above figures were taken with the factory set power and no attempt was made to alter this.

Receiver Tests

The S-meter was checked first. The new LCD bar-graph has two indicators per S-point, with calibration points at 1, 3, 5, 7, and 9. There are then six indicators to show S9+.

S1	S3	S5	S7	S9	//	///	/////
1.25	1.6	2.0	2.5	3.1	4.0	5.0	6.3 uV

This works out to 2 dB per S-point or about 1 dB per *I*.

This again shows that S-meters are very different on VHF transceivers compared to HF equipment. As many signals are obviously stronger than 6.3 uV, this strength indicator is only useful for relatively weak input levels.

Receiver sensitivity was checked at 146 MHz with the following results.

RF INPUT	SINAD	S/N RATIO
.1 uV	20 dB	15 dB
.2 uV	22 dB	18 dB
.5 uV	27 dB	24 dB
1 uV	35 dB	30 dB

Full quieting was reached at about 2 uV with a noise output of -44 dBm.

Receiver audio output was checked by feeding the extension speaker output to an eight ohm terminating power meter with the noise and distortion meter bridging this.

Max Power Output	3.25 watts	28 percent distortion
	2.00 watts	1.5 percent distortion
	.50 watts	.8 percent distortion

These figures are rather better than the specified 1.5 watts at five percent distortion, but I still think that a mobile transceiver of this type should have at least five watts output at below five percent distortion.

Received current drain was checked. The 2550A was .6 amps squelched to .8 amps with one watt of tone output. Relative figures for the 2570A .8 amps and 1 amp.

Frequency stability and accuracy for both transmitter and receiver were checked and found to be better than 100 Hz under all conditions.

INSTRUCTION MANUAL

As I mentioned in my recent review of the TS-440S, Kenwood instruction manuals have improved somewhat of late. I hope they do not stop at this point because there is still a long way to go.

The addition of some good definition photographs of the internal layout would be useful, as would a printed circuit layout. I know that much of the information is included in the optional workshop manual, but as the cost of these is now about $30, this may be beyond many tight-budgets.

However, the following information is included: Controls and their functions; Installation; Operation; Maintenance and adjustment; Operational accessories; Block diagram and specifications.

Operational instructions are very well written and cover a commendable 17 pages. With all of the optional calling systems, much of this information might not be required for normal operation, but it is handy to have it just the same.

The maintenance and adjustment section does not go into anything of a highly technical nature. It contains hints on battery connection, microprocessor reset and lithium battery replacement, a factory agent job, and then adjustments on such things as the low power RF output set and microphone gain control.

CONCLUSIONS

These are both excellent transceivers and are certainly worth consideration if you require a high powered, two metre FM rig. Their somewhat large size perhaps makes them more suitable for a base station operation rather than for mobile use. Kenwood produce a range of compact FM transceivers that will fit into the limited space available in modern cars. If you are trying to decide between the 45 and 70 watt version, I would recommend the higher power version because of its superior final stage cooling. With the larger heat sink and built in cooling fan, it actually runs cooler than the lower powered version.

Thanks to John Hill of Emtronics, Melbourne Division for the loan of the TM-2570A and to Kenwood Electronics Australia Pty Ltd, via Eastern Communications for the loan of the TM-2550A.

EVALUATION AND ON-AIR TEST AT A GLANCE of the Kenwood TM-2570A . . . Serial No 7031506

APPEARANCE

Packaging
- • • Single canon lull of foam box insert.

Weight and Size
- • • Not the smallest or lightest. For mobile use you might prefer one of the smaller units.

External Finish
- • • Very well finished. Although the all black-colour scheme is a bit sombre.

Construction Quality
- • • Well put together with good quality components.

FRONT PANEL

Location of Controls
- • • There are 19 knobs or push buttons, plus a 16 button keyboard. Quite a feat to fit them all in.

Size of Controls
- • • Due to the above, buttons are small and hard to operate, especially under mobile conditions.

Labelling
- • • With the fully illuminated front panel, all labelling is very clear and concise.

Status Indicators
*** On air, centre tune, repeater offset, etc.
LCD READOUT
*** Lots of information presented. Illumination could be brighter.

RECEIVER OPERATION

Memories
**** There are 23 memories with frequency, repeater offset, and even telephone numbers (not much use in Australia).
S-meter
*** The bar-graph representation is good. Like most VHF equipment, the range is limited.
Spurious Responses
**** Excellent. Strong signal handling and rejection of out of band signals is top class.
Sensitivity
**** Excellent. See Test Section.
Received Audio
*** Internal speaker is good and top mounted. With external speaker — very smooth quality.

TRANSMIT OPERATION

Power Output
*** For size of unit, very good. The 70 watt version is the highest powered mobile unit available.
Transmit Audio
*** With supplied hand-microphone — good. With optional MC-60 microphone — excellent.
Cooling (2570A)
**** With built-in fan and adequate heat sink — excellent.
Cooling (2550A)
*** Actually runs warmer than the higher powered model.
Metering
** Power output indicator only.

Manual
Owners Book
** Better than many. Operation covered very well but more information needed.

OVERALL RATING

**** It seems we are never totally happy with any thing, but overall performance is excellent so long as you have the space to fit it in.

RATING CODE

* Poor, ** Satisfactory, *** Very Good, **** Excellent

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JOTA 1986

Greetings once again to all and especially to anybody who has decided to, or been asked to, operate a JOTA station this month.

The 29th Jamboree-on-the-Air will be held over the weekend of October 18- 19, 1986, beginning at 0001 hours ***Local Time*** on the Saturday. JOTA will conclude at 2359 ***Local Time*** on Sunday. Stations may operate for all, or any part of this period.

Either you have every thing under control or, as in most cases, you hope that all will be okay on the day. We know any effort to assist will be much appreciated. Remember these annual events that happened previously for us are still new to the next generation.

If you can go portable at a JOTA location, even though you may not stay long, it is the kind of public relations exercise that is good for both participants.

This year, the Scout and Guide Movement has decided to be the party to initiate a station. It is hoped they will have success and not receive too many "knock-backs" from potential operators.

One highlight of the day will be the Chief Scout/ Governor-General's broadcast from Canberra. (Dural station will avoid last years failure by a VHF relay link if required owing to poor propagation). Reliable VHF communication is good over the mountains and into VK1.

Do not forget, the JOTA station fills in the log and report sheets, supplied by your Scout/Guide Leader. You do not have to fill them in but they are necessary for final assessing of the success of JOTA activities.

During discussion regarding the day, ask how many guests you can expect and if a leader will always be present. If possible always require a pole-tower or tree to be needed for one end of your dipole. This is a favourite pastime for the troops and generally ends-up with their flag atop.

The day does involve some work, but it is a good excuse to do something different.

—Contributed by John Bunn VK2NDJ, VK2 JOTA Co-ordinator, PO Box 1066, Parramatta, NSW. 2150

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SPECIFICATIONS FOR CONSTRUCTING PIPE FOR A FOREIGN GOVERNMENT

All pipe is to be made of a long hole, surrounded by plastic or metal centred around the hole. All pipe is to hollow throughout the entire length. Do not use holes of different length than the pipe.

The inside diameter must not exceed the outside diameter, otherwise the hole will be on the outside.

All pipes over 500 feet in length should have the words "Long Pipe" printed clearly on each end, so the contractor will know that it is a long pipe. Pipes over two miles in length must also have the words "Long Pipe" painted in the middle, so the contractor will not have to walk the entire length of the pipe to determine whether or not if it is a long pipe or a short pipe.

All pipes over six inches in diameter must have the words "Large Pipe" painted on it, so the contractor will not mistake it for a small pipe.

Flanges must be used on all pipes. Flanges must have holes for bolts quite separate from the big hole in the middle.

When ordering 90, 45 or 30 degree elbows, be sure to specify right hand or left hand, otherwise you will end up going the wrong way.

Be sure to specify to your vendor whether you want level, uphill or downhill pipe. If you use downhill pipe for going uphill, the water will flow the wrong way.

All couplings should have either right hand or left hand threads, but do not mix the threads, otherwise as the coupling is being screwed at one pipe, it is being unscrewed at the other.

Contributed by Bill VK3CFL, via Bruce Bathols VK3UV

SHARE YOUR STORY IN AR . . .

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Japan*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0SJ	*Macquarie Island (Keyer)*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Karratha*
52.325	VK2RHV	*Newcastle*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RBB	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hadland*
144.600	VK6RTT	*Karratha*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Karratha*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.475	VK3AQU	*Melbourne (Keyer)*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1. A letter from Dick Forrester VK3VU, advises of a frequency change for the Ballarat Amateur Radio Group Beacon to 432.535 MHz to conform with the WIA National Band Plan. It also confirms for me the existence of the beacon which has not been listed for some time and so now reappears with this issue.

DXPEDITION TO NIUE

Nev VK4ZNC, will be leaving on November 14, to mount another DXpedition, this time to the island of Niue, which has the prefix of ZK and from where I have been listing a six metre beacon for some time under the call sign of ZK2SIX.

Niue is about 4300 km from Sydney at longitude 170 degrees and latitude 18 degrees, placing it east of Tonga. Usually the best Es single hop distance is around 1600 km so it will be more than two hops to Sydney and more than three to VK5. Contact will be possible should a particularly large Es cloud develop and operators will have to be extra alert if seeking a contact. An early morning contact would seem more likely than later in the day, although there is no guarantee of this either as Es is unpredictable and that seemed the most likely mode for any contacts made. Good luck, Nev.

Nev has also indicated only about one third of the stations that contacted him have claimed their VK9LC card for the Lord Howe Island expedition. He wants to clear any backlog of cards before leaving for Niue and will make QSLs available to those who want them until the end of October 1986, after that — no cards! A return postage stamp (no envelope) is all that is requested.

VISIT TO ALICE SPRINGS

During the past month I made a trip to the Northern Territory and whilst in Alice Springs, I had the pleasure of meeting some of the members of the Alice Springs Radio Club. On the appointed night, we assembled in the luxurious lounge of the Sheraton Hotel. Those who met me were the President, Terry VK8TM, Secretary, Peter VK8ZLX, Jeff VK8GF and Tim VK8KTM.

Most of the discussion was VHF orientated naturally! Jeff VK8GF and I had known one another for some 25 years and some of our early days exploits on one metre with super-regenerative equipment caused smiles and interested comments from the other listeners. Other subjects dealt with included beacons, repeaters, QRM from other services at repeater sites, the six metre band and its likely promise of good contacts in the future.

The Alice Springs boys are well aware that their unique position geographically means they will be much sought after again this year for two metre contacts in particular and they will be going all out to provide those contacts around Australia. Improved antenna systems and increases in power will be helpful. They have not overlooked 70 cm and stations with reasonable power are likely to be operating from there as well.

With the likelihood of another extremely good Es season this coming summer and with that meaning good potential for two metre contacts, the Alice Springs boys have certainly got their act together and I hope the rewards will be contacts both ways on all three bands.

It was certainly a great evening spent with some very fine guys and one to be remembered for a long time. On leaving, they presented me with a large "Outback Australia" QSL card depicting Ayers Rock and signed by all four attending. I shall treasure that gift. Thank you.

ROSS HULL MEMORIAL CONTEST

During my discussions with the Alice Springs boys, the matter of the Ross Hull Contest was included as I was anxious to obtain the opinions of a very keen group of operators. I took with me the details of what could be possible changes to the Contest this year, in the light of experience and comments received from last year.

They added to the already known ground swell of opinion that two major factors were preventing operators from showing enough interest to submit a log. They agreed there was little doubt that there are many stations operating during the summer period and giving out numbers and who never submit a log. (VK5LP has a list of 404 call signs on six metres alone for last summer).

Whilst it was agreed every encouragement should be given to amateurs to construct or obtain equipment for the UHF bands, there are many amateurs who, for a variety of reasons, may never get beyond the 70 cm band. If the Contest was limited to the 52, 144, and 432 MHz bands (at least for the time being) it is possible that the already high level of participation could result in the log return like that of the 1960s, when development on the bands above 432 MHz had not been very great. Those able to operate 1296 MHz and above will object, which is natural, but if the Contest is to survive then something has to be done to convince more people they too have a chance of a certificate and hence enter a log.

If we were to revert to the best seven days score then even more operators are given a chance to be in the running. Not everyone can spare three solid weeks before the transceiver.

On the matter of scoring, I do not want to pre-empt what the Contest Manager may be deciding, but last year's one point per contact was judged a disaster! Short distance contacts and very long distance contacts on six metres are certainly worth more than one point. Why not two points up to 1000 km, 1000 to 2000 km one point, over 2000 km two points? On 144 MHz; up to 500 km two points, 500 to 1000 km five points, over 1000 km 10 points, 432 MHz; up to 500 km four points, 500 to 1000 km 10 points, over 1000 km 15 points. For contacts with overseas stations: 52 five points, 144 10 points, 432 15 points. This would make it worthwhile persevering with that ZL or FK contact even if it takes a while to make it. And what would be wrong with offering an extra 10 points for every completed 10 contacts in the log book, irrespective of the band; ie the running total as it appears. You might then consider it worthwhile working the operators already on the band instead of looking for the unworked prefixes (last year) for extra bonus points.

What ever scoring table is produced, it will not suit everyone, hopefully it will suit the majority. Some will say it is over simplified, but then that may be a good idea, it means less fussing around with the dividers deciding on distances. If we do no more than sort out the 1600 km distance from Adelaide to Brisbane (optimum Es path) and place it in the middle of some scale (as it is with 1000 to 2000 km) then something good will have been done. In the 1960s, the then 1000 mile (1600 km) path for a change to 10 points per contact started in the Brisbane metropolitan area, some stations were two points, other were 10, what a shambles trying to sort them out! On the above scales no change over points occur between any two capital cities. There will be isolated operators in country areas where such changeovers could occur, but most will benefit for such a spread of distances.

There is plenty of food for thought. At least contacts under 100 km have not been cut out as some would like. I believe the rules for the Contest will be in November AR, and could be fairly close to the above — at least you have something earlier!

OVERSEAS ON SIX METRES

CQ ham radio for June 1986, from Japan (courtesy VK6RO) shows we are really in the low part of the cycle. On 50 MHz the only stations being worked from Japan have been HL1, 2, 3, 4, and 5 from Korea; VS6s XMQ, XMT, XOR, XLN, and XNF from Hong Kong plus the VS6SIX beacon; and several reports of UA-RADIO on 50.610 AM. All were recorded in May 1986. Quite a few of the HL contacts have been on FM and operation has taken place above 51.000 MHz.

From the same article, it appears 9M2KY, from Malaysia, will be on 50 MHz which could be another country to look for should six metres open to the north.

BT4YRC, in China, has apparently been having two metre SSB contacts into Japan starting last May. One can envisage the dog-piles if he is a lone operator!

WINTER SPORADIC E

Most years there is a period of improved six metre conditions during June and July, and this year appears to have been no exception. Although I was away for quite a while during that period, news of contacts is filtering through. Not a lot has taken place from the VK5 end except on two metres between VK5 and VK3.

VK7ZIF was reported working VK2XJ around 0540 on 24/6; VK2BA reported working FK8EB on 13/7 around midday local time, strong signals, so probably others in VK2 worked him as well; ZL television heard in VK5 strongly for five minutes around 0500 by VK5LP; a number of meteor scatter contacts taking place between VK3 and VK2 which is interesting. Perhaps aircraft enhancement is helping some of these contacts too!

From about the time you read these notes there should be some increase in contacts via Es as we begin to approach the summer period once more. Once again I say to all to be aware of the potential for two metre contacts during periods of high Es at

SMIRK identities, Ray Clark K5ZMS, Secretary (left) and Tex Kennedy N5TX, President.

Photograph courtesy Graham Baker VK8GB

this very low part of the sun spot cycle. More stations will also be trying 70 cm this summer and again there will be a number of stations going out portable over the Christmas/New Year period, which also leads to more possible contacts. I am sure the summer of 1986/87 will be a very exciting one on VHF.

VK5LP is secretly praying for the hot weather to come soon in the hope the two metre rotator will become unfrozen. At the moment it is stuck pointing to Mount Gambier and defies efforts to move it. Being over 70 feet (21 metres) off the ground does not help to improve matters! Might have to be content with just working ZL this year!

The Newcastle Beacon, VK2RHV, on 52.325 MHz was available to VK5 for about half an hour today (18/8 2330) peaking to S3, but no stations to work. Channel 0 also there at sufficient strength to be readable. Sydney Beacon, VK2RSY, on 52.420 MHz very weak.

One could speculate at times as to the potential for contacts if amateurs were permitted to run the same power as Channel 0. It is an interesting exercise when in the shack doing other things to monitor Channel 0. Some days it is there for hours going in and out of the noise, occasionally peaking to S9, etc. Recently, I observed it very strongly around 0100 one morning for more than half-an-hour at a level good enough to produce colour. This would have had to be Es. The occasional lifting in strength observed on other occasions could be due to meteor pings. It has often been said that six metres never closes, only operators stop. That statement may be hard to actually prove, but there is evidence the band is open far more often than we give credit. That is why it is such an interesting band and worthy of more use.

FROM THE PAST

Being of an inquiring nature and interested in items from the past, I was looking through some old *QST* magazines and in May 1939 came across an article *Exploring Below One Metre* which gave details of practical equipment for operation on 325 MHz. An RCA 955 valve was used as a super-regenerative detector sitting in a specially made good quality socket. Hair pins of No 12 wire were used to form the filament lines and two turns of No 16 wire and tapped were used for the grid/plate inductor. Satisfactory contacts were being made over five miles (8 km).

In the June 1940 issue the following UHF Records existed: 56 MHz: W1EYM to W6DNS on 22/7/1938, 2500 miles; 112 MHz: W9WYX/9 to W9VTK/9 on 7/10/1939, 160 miles; 224 MHz: W1AIY to W1KLJ on 27/4/1940, six miles. However, on 28/4/1940 W6BCX worked W6OIN to extend the 112 MHz range to 200 miles!

December 1950 issue was reporting international DX on 50 MHz and distances of 1200 miles on two metres and 200 plus on 420 MHz. The USA record for 1200 MHz was 37 miles and this was bettered in England by G8DD and G3QC, who worked 75 miles. The same two had worked 46 miles on 2400 MHz, but were unable to attack the USA record of 150 miles due to lack of suitable locations.

Since those early days, distances on all bands have been lengthened many times and records continue to be set, but it does not hurt to become nostalgic sometimes!

I also have some copies of a magazine called *CQ* — a magazine issued in the interests of Australian amateur radio, dated 1928 and 1929. These were published each month by the New South Wales Division of the Wireless Institute of Australia and distributed free to its membership. The Editor was J M Bristow. President of the Division was E G Beard with W R Felton as the Secretary. They carried notes about the amateurs from various districts of Australia, technical news, and information including new products, WIA notes on the Federal Convention, also some radio theory, plus articles on amateur radio personalities. Quite interesting!

CLOSURE

Before the Editor starts lifting his pen to erase any of this text I will close off for now. It has been a difficult month to fill the column, having been absent for four weeks did not help and the winter doldrums usually adds to the problems. Activity should pick up soon and there should be more to report.

This months thoughts: *Why does a heated argument create a chilly atmosphere?* and *Sometimes a man gets a reputation for wisdom simply because he does not have enough money to make a fool of himself!*

—73 The Voice in the Hills

Try This!

Tuning Mobile HF Antennas

Tie a length of nylon line to the tip of the antenna before commencing tuning. The length of the line should be a little longer than the length of the car.

Assuming that the antenna is mounted on the rear bumper of the car, drape the nylon line across the top of the car.

Take a VSWR reading of the antenna (using minimum power to reduce QRM). Pull on the nylon line to bend the antenna toward the body of the car and note the new VSWR reading. If the VSWR has dropped that antenna is short. A short antenna is capacitive. Adding shunt-capacitance; ie increasing the capacitance between the antenna and the car body by reducing the distance is the same as adding series inductance.

Use this technique after each adjustment and you will quickly be able to resonate the antenna.

Contributed by Earl Russell VK3BER

MAKE YOUR OWN LABELS

Rob Abel VK2ERA,
106 Derwent Street, Glebe, NSW. 2037.

A neat and simple way to tailor make your own labels for home-brew gear is as follows:

Using ordinary domestic self-adhesive vinyl* (the type used to cover library books, or line kitchen shelves), rub on your chosen label with rub-on lettering transfers,** which are readily available in a wide variety of sizes, colours and styles.

Next cover the lettering with another piece of clear self-adhesive vinyl (with the backing removed), thus making a "sandwich" in which the lettering is the filling.

Cut the label to the appropriate size and shape, peel off the backing of the bottom layer and smooth carefully into the required position. This makes a very neat and tidy label and as the lettering is covered it will not rub off with use.

The label colour is limited only by the colour of the material available.

For instance — on black painted articles clear contact is used for both top and bottom layers with white lettering. I used this method on a small home- brew transceiver with very satisfying results.

* Con-Tact from *Nylex is one type of self-adhesive vinyl.*
** *Letraset, etc.*

BUSHFIRE NETS

The New South Wales Bush Fire Council has begun installing a series of repeater networks.

The first, at Mount Gibraltar, near Bowral, uses an Australian-made 50 watt talk-through repeater with an output on 467.725 and receive on 458.226 MHz.

Five bushfire control centres, with desk-top trigger base radio systems, now use this repeater for inter-communication.

The system is called *Strategic Radio Network.* During major bushfire operations they provide an inter-service link between the Bush Fire Council, National Parks and Wildlife, Forestry Commission, Police, Ambulance and the Army.

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

It is from good authority that the whole DXCC criteria for their prestigious awards program could be dramatically changed.

I personally feel that this could be for the better, but please John W4FRU and your committee, don't take the attitude of throwing all the old paperwork in the air and saying: "Let's start again!"

Many amateurs from all continents are members of the ARRL and most take advantage of the ARRL DXCC. It would be prudent to seek input from these members, many of whom have attained very large country totals — some even being on the Honour Roll.

When problems arise and arrogance, vitriolic remarks, and belittling a society's awards becomes a talking point across the amateur spectrum, something constructive should, and must, be done promptly.

The ARRL is renowned for its impeccable record of being of assistance to the fraternity and its Awards Program is the criteria for all countries, so please Mr Chairman of the DXCC Advisory Committee, amend the criteria constructively, remembering that the majority, if not all DXing amateurs, have struggled to attain their DXCC standings by spending countless hours chasing elusive countries and trying to get their calls recognised over the associated klangfarbenmelodie, when coming across that rare country where a DXpedition has gone, usually at great expense to the participants. Or, maybe it could be a lone amateur in an isolated location wanting a friendly chat.

Next comes the considerable expense of obtaining the valued card, and the accompanying frustration which accompanies such an exercise — an accepted part of the hobby!

Mr Chairman, you are respected and renowned for your clear thinking — please give this problem considerable thought before any constructive changes are made as your decisions will stand for decades to come.

COCOS (KEELING) ISLANDS — VK9Y

A much sought after QSL confirmation from one of Australia's possessions that consists of two atolls, comprising 27 small coral islands, with an all up area of (5.5 square miles) 14 square kilometres.

This outcrop is located at 12.01 degrees east and 96.50 degrees south — the same latitude as Darwin — and approximately 2 250 kilometres north-west of Perth. Of interest, the highest point is no more than six metres above sea level and it enjoys a hot climate that varies between 22 to 32 degrees Celsius complimented by a rainfall averaging around 2 000 mm. The climate could be considered unpleasant in the December — February period of the year for the 410 Cocos Malays and 220 Australian inhabitants, due to the humidity and rainy season.

The main islands are are named West and Home Islands, with other larger coral islands being called Direction, South, Prison, Horsburgh and North Keeling. Probably each one has its own history and the locals have a name for them all, as they are all regularly visited to harvest the coconuts, which are in abundance on the islands, which are shaped in a horseshoe formation. Within the formation is an idyllic lagoon, approximately 16 by 10 kilometres in area and varies in depth to a maximum of seven metres of bright water, coloured from a bright aqua to a dark green. Outside the perimeter of the horseshoe islands, the Indian Ocean can vary in depth to many thousands of metres.

West Island is the main administration area, containing an airstrip, offices, meteorological station, the homes of government personnel, and a school that covers from pre-primary to secondary and is staffed by the West Australian Education Service.

Home Island, is occupied by most of the Cocos Malays, descendants of those who were brought over when Captain John Clunies Ross, a Scottish seaman, arrived two years after its first habitation by Alexander Hare in 1925.

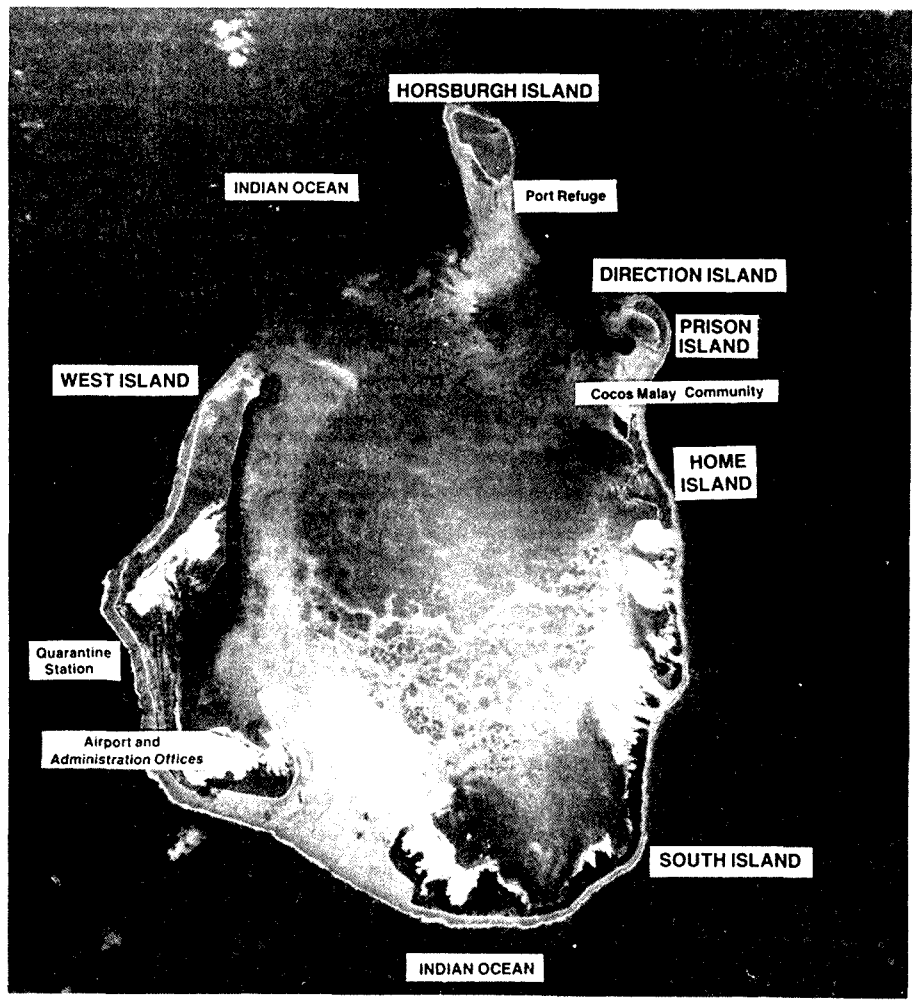
Hare and Clunies Ross both laid claim to the area, even though the North Island was discovered by the British sea captain, William Keeling of the East India Company in 1609. Hare was defeated in his bid for ownership and left for Java six years later.

Further history of the island group indicates they were annexed to England in 1857 and in 1886, Queen Victoria granted all land above high water mark to the Clunies-Ross family who nurtured, cultivated and increased the plantations. It was purchased from John Clunies-Ross and his wife Daphne, after five generations of the families rule, for $6.25 million by the Australian Government. John and Daphne, now live in Perth. Many amenities are provided on the islands, including a small but modern equipped hospital, with one resident doctor and two nursing sisters In attendance, a community radio station (VKW), many clubs and a well stocked grocery/liquor store which is replenished on a weekly basis. Produce including fresh fruit and vegetables are brought to the islands by a charter aircraft which also brings the mail. The arrival of this aircraft is the event of the week!

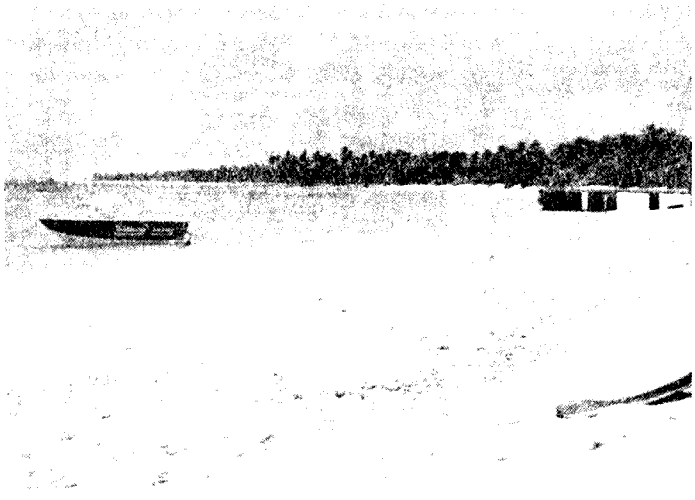
Surface mail, parcels and other hardware are brought in by sea, generally every six to eight weeks.

Amateur radio operation is inconsistent, unless one of the employees happens to have an amateur licence. Over the past years there have been many operators heard from this tiny, much sought after outpost. Some Royal Australian Air Force air crews, such as Alex VK9YA and Paul VK9YB, on stopovers during reconnaissance flights across the Indian Ocean, and individuals such as Frank ex-VK9NYG, have changed the status from 151 to the 51st most wanted country on the DXCC ladder and even the Federal QSL Manager, Neil VK6NE, has done a stint of operating, giving a new country to many DXCC enthusiasts. Amateur operators have to be cautious and considerate in the the amount of power they use, as high power, even within the terms of their licence, can cause BCI, the lifeline of community relations in this confined area.

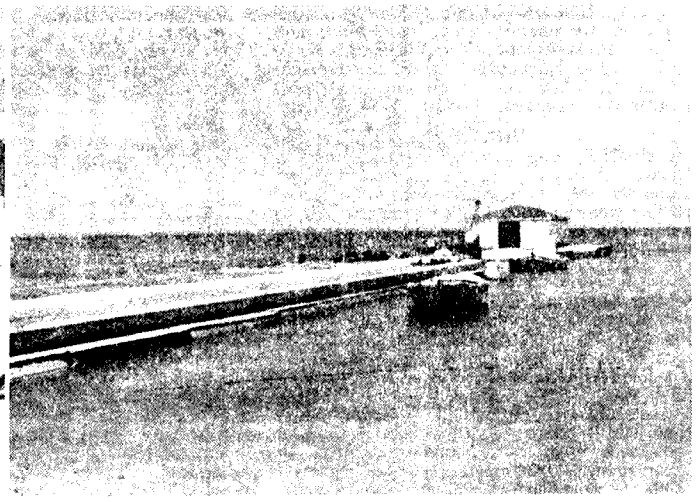
One, if not the first to initiate the the VK9 Cocos



Cocos (Keeling) Islands from the air.
Photograph courtesy the Royal Australian Air Force



Clean Beaches surround the Lagoon.



The Wharf.

prefix was VK9AJ in 1956. His QTH was on Direction Island, however it is impossible to list all operations from this area.

So when you hear VK9Y., call and say you know a little of the area he or she is operating from, provided the operator has not got the multitudes calling, and they are in the middle of a dog-pile!

Neil VK6NE, relaxing on Cocos.
—Photograph courtesy Neil Penfold VK6NE

HELP! ! !

Information from any operator who can assist with information on the whereabouts of Art ex-ZD1FG, who operated from Njala in 1958.

This information is required by Bill VK1WB, for confirmation of two phone contacts. All replies will be appreciated at Bill's new QTH which is: 8 Eacham Avenue, Paradise Lakes, Qld. 4126. Australia.

The co-operation of overseas magazines and DX news sheets would be appreciated.

FAILURE TO QSL

Joy VK2EBX, notes that she has had no success for the following call signs in the QSL's "In the Bag" department.

9H1EU (bureau); A4XX (bureau and direct); EA8LS (bureau and direct); EA8ANT (bureau), FG4CB/FS via FG7CB (direct); FG7CC (two direct); GD4DPK (direct); J87BS (two direct); JT1AO (direct); PZ1BM (direct); TI9J via TI2J (direct); YN5RR (two direct); and VE1BZV (one bureau and four direct).

Very frustrating, Joy. Unfortunately, it is a way of life that has escalated over the last decade and we have to live with it. On the brighter side, the non-return of cards is quite a low percentage and in my particular case, after much nail-biting at times, the return is 100 percent. Trying to procure cards on other people's behalf, I have to admit, has not been so successful.

With the increase in postage rates, one has to think twice about sending a card direct, however the members of the Institute save with the voluntarily manned bureaus. If they are keen DXers the bureau virtually pays for their membership.

AMATEUR RADIO TO THE RESCUE — AGAIN

In mid-June, Bharathi VU2RBI, a YL operator and Subramanyam VU2VSN, intercepted a Mayday call on 40 metres. They contacted Bruce HP3YM/MM, on board the vessel *Yathi* with a crew of four. The vessel was in trouble and the VUs arranged for fresh water, food, medical supplies and rescue by the Indian Navy. All concluded happily and NIAR is discussing recognition for the above mentioned operators and their helpers for their assistance.

GOVERNMENT SUPPORT

The Indian Government has agreed to assist and subsidise the setting-up of amateur radio centres along the Indian coastline to assist if necessary in a disaster and to fit into the countries Natural Disaster Master Plan. They hope to increase this support throughout the country.

Praise must be given to this Government for their recognition of the part well-trained volunteer operators can play in emergency communications if the need arises.

ST PETER 1 ISLAND

It is believed that Bob KD7P has been given licence approval for operation from this island in December. He now awaits landing permission from the Norwegian Foreign Department.

Cross fingers and calculate your beam headings, this could be a good one! He also hopes to make the same trip next year.

WILLIS ISLAND

This island is not far from mainland Australia, but has been rather remote with communications for the Meteorological Station staff, when they have had to pass their weather observations back to the mainland.

Not now, as new telephone circuits have been installed that will be relayed by Australia's own AUSSAT satellite. This system is known as *ITERRA* (an aboriginal word meaning 'be quick').

ITERRA will link the island with voice and data access to anywhere in Australia via Telecom's switched telephone system.

MOHELI ISLAND

A new one for the too-hard-basket probably. 5I0A was expected to be operational from this Island in July.

The island is located in the Mozambique Channel.

According to research, it is apparently a part of the Comoros group, but it is claimed by Tanzania, thus the 5I prefix which is within their allocation and it could be a possible for being in excess of the 250 mile radius as laid down by the ARRL DXCC Rules.

It is one of those that we will have to work first and worry later about because the examination of claims and relative paperwork as to the authenticity of the Italian operators allocation of a call sign, could take a considerable time.

PRIBILOF ISLANDS

It is unfortunate to report that the issue of the Pribilof Islands is causing some harsh words to be written by Dan Robbins KL7Y, President of the Alaskan DX Association, (ADXA).

In 1983, the AXDA requested the ARRL to add this island group to the DXCC Countries List by virtue of point 2 of Countries List Criteria. After two years, the DX Advisory Committee voted for an acceptance of these islands as a new country. Unfortunately, the Awards Committee of the ARRL were persuaded not to add this to the DXCC list.

There seems to be no rhyme nor reason to the non-allowance considering the Advisory Committee's advice. Why have a volunteer committee and not take their advice? In other words, it is a waste of time for all parties concerned, particularly when volunteer labour is getting harder to come by.

Space does not permit the full context of Don's letter to be reprinted but could it could be another 4U1VIC debacle repeating itself. Let us hope not, but hold onto those Pribilof cards in the interim, if you were lucky enough to make the grade with an entry in the log at the time.

CHINA

BY5QH, was due to commence operation on August 20, and BY5HZ is scheduled to send RF up the coaxial cable this month. At the time of writing these notes, unfortunately no QSL information is available but it is nice to see more BY stations participating in the hobby.

John Cieh, the Chief Operator at BY4AOM, is assembling a 2 kW linear amplifier. John is receiving much assistance from Tom Wong VE7BC, the person, who in my opinion deserves complete recognition for getting BY back on the air. Tom still makes regular trips to China.

BY4AOM is QRV on both 20 and 15 metres, frequently looking for VK stations.

Any amateurs visiting China are made most welcome as guest operators at many of the amateur radio stations such as, BY1PK, BY4AA, BY4AOM, BY4RA, BY4RB, etc.

Further information may be obtained by sending three IRCs and a self- addressed envelope to Bob Winn, Editor, *QRZ DX*, PO Box 834072, Richardson, Texas, 75083. USA. Endorse the envelope, "BY Station Information."

UNUSUAL PREFIXES

You were not hearing things as SJ9WL and LG5LG were legitimate CW and SSB calls being aired by the Norwegian Handicapped Radio Amateur Club (NIHRAH). They were operational from Morokulien in July.

UNICEF

The UNICEF 'gang' planned an operation from Godavari, in Nepal, using the call sign of Father Moran 9N1MM. The operation was to be during the first week of August. Please do not OSL to Moran or his Manager on this one but direct or via the bureau to the operators instructions.

AM0EEE

Another new prefix and suffix was due to aired from August 4- 15, to commemorate the entry of Spain into the ECC. Special calls from various parts of Europe with special OSL cards were scheduled as follows:

4th — Madrid, 5th — Paris, 6th — Lisbon, 7th — Brussels, 8th — Luxemburg, 9th — Rome, 10th — Bonn, 11th — London*, 12th — The Hague, 13th — Athens, 14th — Dublin and 15th — Copenhagen.

QSLs to be sent to EEE, PO Box 2071 cp, 50080 Zaragoza, Spain.

** At the time of preparing these notes, the UK licensing authority had no knowledge of any operation and therefore it would appear to be illegal in the UK. The status of other countries is unknown. Another case of wait and see. Late unconfirmed news is that a UK licence would not be allowed.*

CARDS RECEIVED

Steve VK2PS, has not had much time to operate of late. However his collection of cards is growing, mainly from using the VI prefix. Some of the cards received are 5W1EJ, 6Y5MS, 8J3JST (The 100th Anniversary of Japan Standard Time), 8S7BSJ (Boy Scout Jamboree in Japan), HI1FYH, JT1BH, LZ2KTS, OE5BGL, VE7EXPO, VO1CA, VR6TC, VS8AO, VS6TQ, YE3C (40th Anniversary of Indonesian Signal Corps), XE1AFQ, XO3IY, XX9DX, YO6AKN, YO7BSN and ZK2KH.

MOUNT ATHOS AGAIN

Well known DXers, I0DUD, I0IJ, I0ER and I0GPY attempted to activate the much wanted and discussed Mount Athos country last month. They had more than adequate equipment organised and were progressing favourably with the Greek authorities until the local society apparently objected and the whole project was aborted.

Incidentally, there seems to be a jinx on operations from this area. Perhaps, as one of the Monks is an Australian, some VK operation may succeed, but apparently it is not as easy as that as all the different groups of Monks have to agree and then get the approval of the SV Society.

All the paperwork for the last operation is in ARRL hands and there should be an answer soon. Apparently it is fairly similar to previous expeditions paper warfare but it is a case of wait and see. Not an unusual occurrence for the DXer!

BITS AND PIECES

The 4U1VIC controversy is still on the boil. . . * * Martti OH2BH, was active from the new QTH of Mika 5B4TI, for the European CW Contest. * * 8O2, is a special prefix for the 20th Anniversary of Botswana's Independence and will be used until the end of this month. * * Gerben PA0GAM, was operational from the Sudan last month, using the station at the Youth Palace — 6T2YP * * XU1SS, is still operational on an irregular basis. */* I spoke with Brian BERS 86037, whilst he was in Melbourne on business and he hoped to be signing as VP8BGT, from the Falklands later this year. * * The station signing VK9VO, supposedly from Christmas Island is very suspect!! * * Arnold WB3DAO, is looking for friends in VK to exchange stamps and stickers with. His QTH is PO Box 700, Jessup, MD 20794, USA. * * Unfortunately the published address of KG4TR, may be incorrect and it is not listed in any publication. * * Apparently their is a film titled 'Agent Vikram' presently being screened in India, which shows our hobby in a bad light, with the emphasis being on an anti- social and anti-national theme. It is possible that this film may be released in other countries including VK, under another title. * * Four French operators hoped to activate Clipperton towards the end of last month, whilst en route from San Francisco to Acapulco, on a French Naval vessel. * * Have you heard P5AGJ? He is giving his QTH as PO Box 1216, Heungman, North Korea. Another question — is he genuine? If the paperwork is correct it could be a new DXCC country. If not, the name of his town may be appropriate if a few avid DXers track him down. * * Ron ZL1AMO, hopes to be active from VK9X Christmas Island, this month. * * Jean-Paul 5R8JD, went QRT on August 15, leaving Alain to carry the 5R8 banner. * * Hiro, formerly JA1WTR and VU2WTR, is now stationed at the Japanese Consulate in Singapore. What call this time, Hiro? * * Another operation from Cocoa TI9 , is possible in the near future. * * The OH0/OJ0 DXpedition made 18 257 QSOs during their stint and lived through a horrendous storm. They lost a tower in 70 MPH winds, which was retrieved, but had considerable damage. The beam and 160 metre antennas are still somewhere in the Baltic Sea.

QSL AND QTH NOTE

Every effort is made to check the authenticity and correctness of addresses and QSL managers published in *Amateur Radio* but it is emphasised that the magazine or the writer cannot be held responsible for incorrect addresses, wrong managers or non return of cards.

QTHS YOU MAY NEED

3C0A	TR0A, PO Box 1826, Libreville, Gabon.
4V2BM	PO Box 1419, Port Au Prince, Haiti.
4X5J	PO Box 4099, Jerusalem, Israel.
5R8JD	TU2NP, PO Box 1518, Abidjan 01, Ivory Coast.
5V7JJ	PO Box 30, Niamtougou, Toga.
5W1FT	PO Box 184, Apia, Western Samoa.
5Z4DO	PO Box 30270, Nairobi, Kenya.
6T2MG	PO Box 49, Khartoum South.
6W2EX	F6EYS, 8 Rua du General Ganeval, F-91290 Strasbourg Villa, France.
8P6GI	KA6V, 93787 Dorsey Lane, Junction City, OR 97448, USA.
A35SA	PO Box 1553, Nuku'Alofa, Tonga, South Pacific.
A4XOS	ROARS, PO Box 981, Muscat, Sultanate of Oman.
BY4SZ	PO Box 51, Suzhou, Peoples Republic of China.
C30C	F8RV, 14 Bis Ave General Compans, F-31700, Blagnac, France.
CN8LS	PO Box 3007, Casablanca, Morocco.
CO7JC	PO Box 5343, Camaguey, Cuba.
D44AD	Rua 5 de Julho, Praia, Republic of Cape Verde.
DV7CE	PO Box 238, Bacolad City, Philippine Islands, 6001.
EP2DL	PO Box 17845-151, Teheran, Iran.
FK8A	PO Box 3956, Noumea, New Caledonia, South Pacific.
FO0ASJ	N5DD, 3008 Southwestern Boulevard, Dallas, TX 75225, USA.
HH9E	PO Box 243, Fort Liberte, Haiti.
HP8RHT	PO Box 80, Aquadulee, Panama.
J28DQ	PO Box 2722, Djibouti.
J87CD	PO Box 975, St Vincent, Windward Islands.
J88AC	PO Box 142, St Vincent, Windward Islands.
JY8NT	PO Box 148, Cambridge, England.
KH6JEB/KH7	KH6JEB, 95-161 Kaupoae Pl, Mililani Town, HI 96789, USA.
KP2AH	WA2YMX, 3465 Carrolton Avenue, Wantagh, NY 11793, USA.
S84MP	6 Ebony Street, Umtata, Transkei
SV5OX	PO Box 251, Rhodes Island.
SV5TX	PO Box 251, Rhodes Island.
SX1MBA	RAAG, PO Box 3564, GR-102 00, Athens, Greece.
TA2L	Ustun, SOK 11, Ayranci, Ankara, Turkey.
TI8CBT	PO Box 119, Puntarenas, Costa Rica.
TLBHZ	PA0ZBL, Vissersdijk 13, NL-3319 GT Dordrecht, Netherlands.
V3EE	PO Box 852, Belize City.
VO9ZZ	N4GNR, PO Box 433, Toccoa, GA 30577, USA.
W3HNK	PO Box 73, Edgemont, PA 19028, USA
W4FRU	PO Box 5127, Suffolk, VA 23435, USA.
WH8AAP	PO Box 8, Pago Pago, American Samoa, 96799 USA.
YASME	PO Box 2025, Castro Valley, CA 94546, USA.
YK1AO	PO Box 245, Damascus, Syria.
XT2BR	F6FNU, 7 Res du Val, Ollainville, F-91290 Arpajon, France.
YM3KA	PO Box 937, Izmir, Turkey.
ZC4AP	JSB, BFPO 53, London, England.
ZK1AL	PO Box 90, Raratonga, Cook Islands, South Pacific.
ZK1XV	VK2BCH, PO Box 344, Forster, 2428, New South Wales.

QSL TO

1A0KM:I0MGM, 1Z9A:W7PHO, 1Z9B:W7PHO, 1Z9D:W7PHO, 1Z9E:9V1VY, 3A2EE:F9RM, 3A2GX:I2YAE, 3A2LF:JH2QFI, 3A2TA:F8CL, 3A3WPX:DJ9JB, 3B8DB:K5BDX, 3B8FE:388CF, 3C1YL:N4NX, 3D2AB:WB8WMS, 3B8MS:VE3TEN, 3C1YL:N4NX, 3D2HE:VE3FXT, 3D2RF:VK3VU, 3D6BF:LA7IL, 3V8ZY:IN3RZY, 3X3JA:JA1HGY, 4A1HC/2:AA5B, 4A2O:XE2AO, 4C1XWS:XE1CWS, 4K0A:UA1MU, 4K0B:UA1MU, 4K0COC:UA3AOC, 4K1GAG:UQ2OC, 4K1QAV:UA1QAV, 4M4A:K3UOC, 4N0IARU:YU4FRS, 4N3KV:YU3JS, 4O0IYY:YU2AKL, 4O1WCY:YU1FJK, 4O2WCY:YU2DX, 4O3WCY:YU3ER, 4O4WCY:YU4EBL, 4O5WCY:YU5CXY, 4O7WCY:YU7AJD, 4O9WCY:YU7BCD, 4O4I:YU4EGZ, 4O4M:YU4EGZ, 4S7VK:DJ9ZB, 4T3S:OA4CIT, 5H3ZR:OH6IQ, 5V7AS:IT9AZS, 5V7HT HB9TK, 5W1EE W6OUL, 5X5MB:G0BNA, 8R1L:DJ6BC, 8R1Z:WI4K, 9N1MM:N7EB, 9U5JB:ON5NT, 9Y4DX:AG1J, A71AA:DJ9ZB, A71AM:DJ9ZB, BV2FA:DJ9ZB, CO5GV:W3HNK, CO6OF:WA3HUP, CQ6UW WA3HUP, A35NK:K6KEW, CSIOF:WA3HUP, D68WS:DJ6QT, DF8AN/3A:DF8AN, FM5DZ:F6FNU, FM4DR:F6FNU, HZ1TA/GO1:I8YCP, KC6CM:I5JEO, KR7Q/KX6:KR7O, OD5BP:DL1FZ, OH0MD/OJ0:OH2BH, IM0JOO:IS0WON, J40DT:SV0 Bureau, K8MN/OH0:WA6JOC, P43DO:PJ3DO, PA3DZN/3A:PA3DZN, SV0AC/SV9:AA4LU, VK0SJ:VK7RM, XE86ALH:XE1ALH, XQ5CFR:CE5CFR, ZC4AK:Bureau, ZC4CZ:G4MGO, ZV2BW:PT2BW, ZV2KT:PT2KT, ZV2ADV:PT2ADV.

* OSL NOTES: (1) SM2EKM is still the Manager for SM2DWH/S2 (1974). Cards are still available and it is valid for DXCC. (2) VE3EWY, Is still the Manager for VP2KU (St Kitts 1972). Cards are still available.

MACAU — THE FUTURE?

The future of XX9, formerly CR9, with a population exceeding 400 000, is at stake.

The 15.5 square kilometre tourist area, likened to Monaco because of its casinos and easy way of life, is dependent on its neighbours, and most particularly Hong Kong, some 60 kilometres away, so much so that its currency, the Pataca is 'tied' to the Hong Kong Dollar for tourist trade and massive investment.

Macau, unlike Britain's lease of Hong Kong which expires in 1997, has been under Portuguese rule since the 16th century when the Chinese, according to the Portuguese authorities, granted them title to the area in 1557, however any documentation has been purposely mislaid or just lost, if it did exist.

In 1976, the Portuguese government of the day agreed to release the area to China, but have still carried on their rule as before. However, in the 1984 general election eight Chinese out of the 17 member Legislative Assembly were elected. Maybe this is not surprising as some 95 percent of Macau's stable population are ethnic Chinese, with the balance being Portuguese and Macanese.

It is interesting to note that, although the legal system and official language is Portuguese, most of the inhabitants speak Cantonese.

A meeting in July between the two interested countries achieved very little and it is hopeful that talks scheduled to be held in Peking last month may have been fruitful in resolving a smooth transition for the populace.

Undoubtedly, there will be a change of ownership and another prefix will be issued to delight the prefix hunters but how will the new administrators resign themselves to casinos, trotting tracks and other attractions which is not part of their lifestyle.

It is felt that it will be a wait and see situation, depending mainly on economics and as to how it affects the neighbouring populace.

THANKS

Sincere thanks are extended to the following:

The Editors of weekly, biweekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-QSO, DX FAMILY FOUNDATION NEWSLETTER, INSIDE DX, JAN and JAY O'BRIEN'S OSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, PAPAKURA RADIO CLUB BULLETIN, ORZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER.

Magazines including, BREAK IN, cqDX, DX POST, JA CQ, JARL NEWS, KARL NEWS, OST, POLICE LIFE, RADCOM, VERON, WEATHER NEWS and WORLDRADIO.

Members who have contributed include VKs 1WB, 2PS, EBX, 3PC, YL, L30042 and VK6NE. Sincere thanks to one and all who have made this months column possible.

ar

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CS-201G, 2 pos, coax switch	POA
CN-620A, SWR/Power meter	POA
CN-520, SWR/Power meter	POA
CN-540, SWR/Power meter	POA
CN-410M, SWR/Power meter	POA
CN-460M, SWR/Power meter	POA

WELTZ

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SP-225 SWR/P 1.8 - 200 MHZ	POA
SP-220 SWR/P 1.8 - 200 MHZ	POA
SP-122 SWR/P 1.6 - 60 MHZ	POA
SP-425 SWR/P 140 - 525 MHZ	POA
SP-420 SWR/P 140 - 525 MHZ	POA
SP-350 SWR/P 1.8 - 500 MHZ	POA
SP-250 SWR/P 1.6-60 MHZ	POA
SP-45M SWR/P 140-470 MHZ	POA
CT-15A&N 50W Dummy Loads	POA
CT-20G 2.5 GHZ Dummy Loads	POA
CT-300 250 MHZ Dummy Loads	POA
CH-20A&N Coax Switches	POA
DF-72A 144/430 MHZ Duplexer	POA
TP-05X 50/144/430 MHZ P. Meter	POA
CC-50N 100-1300 MHZ Coax Coupler	TBA

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Daiwa PS 310M 31A (25A Cont.)	POA
Daiwa PS 120M 12A (10A Cont.)	POA

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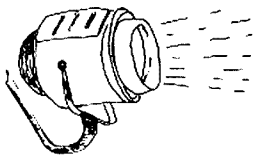

Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

As you have probably noticed, there is a new address under the Masthead. I am now living in the western suburbs of Launceston. Although I am writing this six weeks before moving into the new QTH, preliminary indications are that it should be satisfactory.

Conditions of late have improved, although the QRM on the lower frequencies, particularly noticeable in summer months, is starting to be heard. Fortunately, conditions on the higher frequencies will improve to make up for the tropical bands being too noisy. I also suspect that we have emerged from the bottom of the Sunspot Cycle, as a number of spots visible on the Sun's surface, are slowly increasing.

BUSY, BUSY, BUSY!

This month of October is a busy one for the amateur. Firstly, the annual VK/ZL Contest, with the Phone Section on the 4th and 5th and the CW Section, one week later. On the 18th and 19th we have the annual JOTA participation. This year, because I will be away on my honeymoon, I will not be participating as VK7RH/P. It will be my first break from JOTA since 1973.

CHANGING THE TIME

At the end of this month, we see the re-introduction of Summer Time in VK2, 3, 5, and 7. This corresponds to the end of Daylight Saving Time in the States on the same day. DST ends officially in the UK on the 19th. Those interested in trying to get those elusive Brazilian DX catches, note that Summer Time was also introduced there as an energy conservation measure last November. They may do it again this month!

COLLECTORS PIECES

I recently received details from William Perleberg L70043, of "Sunrise Gardens", Fern Tree, Tas. 7101, concerning details of Radio Beijing utilising a French Guiana relay for their programming to North America. The Montsinery site of Radio France Internationale was reportedly using 11.980, 15.230, and 15.445 MHz at 0300 UTC. Also, RFI was able to utilise Chinese HF transmitters as a consequence of the trial reciprocal broadcasting agreement. If you wish to hear these broadcasts now, you are too late as the new French Government, under M. Jacques Chirac, was unable to reach agreement on continuing these reciprocal privileges.

If you are lucky enough to obtain QSLs for RB, via Montsinery or RFI via China, hang on to them as they will be collectors items. France is reportedly going to construct relay facilities in Sri Lanka. These are going to be in the southern part of the island nation, well away from the troubles of the north, which have plagued the Deutsche Welle site at Trincomalee.

FURTHER TO . . .

Whilst we are on reciprocal agreements, yet another Asian broadcaster recently signed an agreement to utilise transmitter sites in North America. Radio Japan and Radio Canada International will exchange programs over each others senders. At the present time, I am aware that Radio Japan (NHK) will commence relaying from the Sackville site in October or November, to relay their North American programming. The Sackville site is also used by the BBC and DW to relay programming to the same target areas.

HOT WATER

Presumably RCI will use the NHK facilities to beam programs to Asia. Until recently, this area has been largely neglected by Canada. They commenced producing a Japanese commercial program, which is aired via Radio Tanpa, the Japanese commercial shortwave broadcaster, on a weekly basis.

Also, a Chinese language program and English/French information has been aired over cable systems in Hong Kong occasionally. Both, I believe were produced in Vancouver, BC. Incidentally, RCI got onto a little hot water with its US audience following plans to axe releases to the US. The reaction to this Budget Saving measure has taken RCI by surprise. Apparently, there are more listeners in the US than they thought!

WATCHING THEIR Ps and Qs?

Looking at the August issue of *Monitoring Times* which is published by Bob Grove, a well-known DXer, I see that the Bills in the US Congress are rapidly speeding towards ratification in the Senate. It aims to prevent casual radio listeners from intercepting mobile phone calls or remote broadcast links. If the Bill becomes law, an SWL could face up to a year in a Federal Prison and a US$10 000 fine, if convicted of violating the Communications Privacy Act.

This Bill is designed to protect the privacy of Mobile Cellular Phone Systems which operate around 800 MHz. Many hobby groups are fighting provisions in the Bill which will restrict their monitoring activities in the legally-receivable spectrum. They suggest that instead, cellular system owners develop and install electronic or digital encoding to enhance the privacy of phone calls. It was unfortunate that one scanner manufacturer advertised the fact that his models were able to intercept the Cellular Mobile Frequencies. This made the US legislators angry and eager to enact the Bill. The company subsequently withdrew the offending advertisement. At deadline time, it is still unclear if the Bill has become law in the US. I will keep you informed.

I also note that cordless phones are continuing to be a problem. Recently, American police dispatchers began to receive calls from "phantom dialers" who locked up the police switchboards. It soon transpired that, when the batteries on a cordless phone get weak, they are susceptible to pulses from household electronic appliances such as microwave ovens, etc. They then begin dialing random digits, usually 911, which happens to be the emergency phone number over there.

I wonder if similar problems have been encountered here? I have certainly experienced problems from second, third or fifth harmonics from them falling within the 80, 40, and 30 metre amateur bands, often landing on a weak DX signal.

Well, that's all for October. Until next time, the best of 73 and good listening!

—Robin VK7RH

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

Statistics for the May examinations were received recently. It was very pleasing to see that the Novice pass rate was again up to where it was some time ago.

For the interest of those keeping track of such matters, I present a summary of the theory results and some comments.

VK		AOCP	NAOCP	
	SAT	% PASS	SAT	% PASS
1	6	50	3	33.3
2	75	37.3	64	67.2
3	73	28.8	50	50
4	56	35.7	29	65.5
5/8	24	16.7	19	26.3
6	37	29.7	25	52
7	2	0	8	50
TOTAL	272	32	198	55.5

The AOCP pass rate is still low, however.

It becomes more interesting when we look at it in terms of the examination papers used. For Victoria and New South Wales, three papers were used, one for each capital city and the other for the country centres, so it is difficult to compare their results on a state basis. However, the AOCP paper used for the country centres was also used for all the examinations in both Queensland and South Australia/Northern Territory, resulting in widely differing pass rates at both levels.

This suggests that there is a "Quality of Student" factor, but for the regulations examination, VK5/8 had 58.3 percent pass to 41.4 percent for VK4.

Is there a statistician in the house?

The variations between examinations by state are often greater than the variations between states for the same examination. Unfortunately, I do not have time or background to go into much depth in these analyses, but if any reader wishes to go further, I would be very interested.

Readers may have noticed that we do not have a sample examination paper this month.

Most of the papers that have been prepared over the years have now been published. I intend to start producing some more, but have not had a lot of feedback on whether or not the regular publication should be continued. I would appreciate comments on this, and I would be more than pleased to receive questions which could be used in sample papers.

—73 Brenda VK3KT

AMENDED JOTA CALLING FREQUENCIES FOR AUSTRALIA

80 metres — 3.590; 40 metres — 7.090, 20 metres — 14.190; 15 metres — 21.190; 10 metres — 28.990 MHz.

Remember JOTA is on the 18th and 19th of this month. Please participate!

TECHNICAL MAILBOX

Many readers would have read the letter from Albert VK6ARD, of Cottesloe, Western Australia, in last month's *Over to You!*. Albert suggested that AR "devote space to a section of our excellent magazine to a Question and Answer session."

Well Albert, we have done just that! Your letter gives heart to us that we were not alone in the idea.

To Albert's suggestion of the best way of cutting "foam plastic", one further suggestion — for safety reasons, I suggest that this is a job to be undertaken only when your wife is out shopping!!!

Now, In reply to your questions, Albert. . .

. . .Albert asked why his power supply zener diode and fuse blows regularly when powering his two metre, 25 watt transceiver. The power supply is rated at 6-8 amps. Boy! This is somewhat difficult to answer without a circuit and component list! Write us again Albert and I am sure we can provide the answer.

In the meantime, study the circuit and check the component ratings. If it is a simple shunt, zener regulated supply, measure the zener current. Is it within its rating? (viz dissipation too high?). You would not be the first to be an owner of a commercially engineered "bomb."

Maybe, as you specifically mention two metres, it could be a function of the RF from the transceiver somehow finding its way across the zener. Perhaps inadequate earthing, high SWR or a quarter wavelength multiple DC supply lead has a bearing on your problem. If this is so, then RF bypass the zener, improve your earthing and SWR or use a shielded cable for the DC power feed. Without a "mud map" further help is a little limited. If the suggestions do not lead you to a cure, as I said earlier, write again. It is well to remember that such problems always have an answer even though it may require several minor changes to effect the remedy.

As a sideline, it was once said of one manufacturer that, after the design engineers completed the prototype unit, the "sales engineers" moved in. They commenced removing each component (individually). Finally, with a box full of "redundant spares" and after the unit failed, that the last component was then replaced to provide the production-line model! Perhaps things have not changed very much with modern trends, regardless of the drop in minor component prices?

Albert also asked why "it is necessary to have, in an ATU, a variable capacitor in series as well as in parallel?"

I cannot figure out just what configuration you are referring to in this case. Sorry Albert, but further information is necessary on this one please!

VK2 . . ., of Epping, New South Wales, writes of problems he has experienced on 14 MHz with incessant breakers coming in from North American stations, whilst working across Australia.

Normally this column addresses only "technical matters" however, perhaps we can see our way clear to add a paragraph or two on operating techniques!

Since the "American Phone Band" has been extended down to 14.150 MHz, it has at times become fairly crowded. In some cases it is not always possible to choose a lower band to chat to your long-time friend and thus you are faced with operating on a "DX-Band."

It is always best to contain oneself when breaking in on a QSO. Some do just that — break-in. Remember to listen and find out what the stations are talking about and then only if appropriate knock gently and wait to be invited into the QSO. Don't crash right in. If two operators are engrossed in a technical discussion or are talking of matters which are of little common interest to you, don't crash the door in just to get a report on your latest shack change. Don't be lazy! Find a clear channel and call for a report. You will normally get a response.

Now back to your original problem — the arrogant breaker! This may help! He is probably just finished putting up his six element beam at 40 metres, receiving your 100 watts at S9 +20 and wants to know if his 2 kW can get to "down under." Query the breaker, then respond to a "mobile station" in the breaker's call area. Ignore him! Compliment the mobile station on his 9+ signal from his two metre whip, etc. After this QSO, go back to the breaker. Take a couple of overs to get his call sign and another couple to get his name and a R3 S3 should seal the situation! He will disappear to look for the "problem" and allow you to continue your QSO!!!

ar

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA BIRTHDAY YL ACTIVITY DAY

Our Birthday YL Activity Day on July 26, was very pleasant and we were able to catch up with several DX members, mainly Canadian, American and New Zealand YLs.

Several "semi-nets" formed, and we had the opportunity to chat to some of the girls we had not heard from in a long time, plus meeting others for the first time.

Unfortunately, propagation was not all that good, very little being heard on 10 or 15 metres. The main DX activity was on 20 metres, with VK and some ZL activity on 80 metres later in the day.

I heard no European stations at all, which was very disappointing. It would be interesting to know if anyone did have a European YL contact during the course of our Activity Day.

Although not too many ALARA members were able to participate in our special birthday celebration, those who did had a most enjoyable time; so much so that we are seriously considering another such Activity Day for our next birthday.

ALARA CONTEST

With the ALARA Contest just around the corner, it may by an opportune time to remind everyone about the special trophy to be awarded for the highest aggregate score over five years of a licensed YL operator (not necessarily Australian). The year of commencement was 1983.

Our Contest Manager, Marlene VK2KFQ, has compiled a progress report to remind us all that the five-year trophy award is still running, just in case any of us might have forgotten.

Here are some of the aggregate scores so far:

Wendy VK4BSQ	2818	Helena VK7HD	932
Kim VK3CYL	2401	Valda VK3DVT	921
Gwen VK3DYL	1667	Jenny VK5ANW	859
Mavis VK3KS	1383 + 1 check log	Denise VK5YL	677
Joy VK2EBX	1238	Elizabeth VE7YL	564
Bev VK6DE	1235	Poppy VK6YF	478
Freda VK2SU	1014	Joyce VK2DIX	428
Val VK4VR	979	Pearl ZL2QY	214

CW operators do have an advantage when it comes to scoring, because all points are doubled for CW contacts. Novice YLs have the additional award to compete for — the Florence McKenzie CW Trophy. Two very good reasons for getting those CW keys dusted down and into operation, ladies.

ACTIVITIES

A very pleasant ALARA Birthday Get-Together was organised by Meg VK5AOV, for VK5 members, beginning with a smorgasbord lunch at the Belaire Hotel and concluding at the QTH of Joy VK5YJ, for afternoon tea. A most enjoyable time was had by all, even if it did leave them all feeling somewhat 'fed-up.' (All that food creates havoc with diets).

The VK3 girls attended a luncheon to celebrate ALARA's birthday, and enjoyed a delicious meal. There was probably as much talking as eating, and the function was pronounced very successful and enjoyable. Plans are afoot for another luncheon next year.

(After writing this I am beginning to feel a bit hungary myself — excuse me while I go and make a sandwich).

Congratulations to Maria VK5BMT, who has achieved the South Australian Jubilee 150 Award on VHF

Congratulations of a different sort to our Contest Manager, Marlene VK2KFQ, and her OM Ron VK2EFJ, whose little harmonic, Kate Laura was born on July 2.

There were 15 ALARA members, including Celia ZL1ALK, joined into the ALARA Birthday Net on July 28. Quite a good attendance on such a cold, bleak, curl-up-by-the-fire sort of night.

JOTA

This is Jamboree-on-the-Air month, JOTA being held on Saturday, October 18 and Sunday, October 19. Many ALARA members involve themselves with this activity, which is usually enjoyed by Scouts, Guides and amateur radio operators alike. If you have never tried JOTA and would like to participate this year, contact your local Guide or Scout Troop or your WIA Divisional Office.

NEW MEMBERS

Additions to the membership list (July AR).
VK3 Associate member — Margaret Hamilton, July 20, 1986.
Angie G0CCI, February 25, 1986.
Welcome to Margaret and Angie.

—Until next month, 73/33, Joy VK2EBX

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In full sunlight conditions, it charges at half the normal recommended wall plug charge rate, or where mains power is available it can be charged in the normal manner.

Parallel or series solar charging is possible because each cell charges individually, and with the use of protection devices during discharge, offers the option of building solar systems of almost any voltage or amp hour rating using these single cell NiCads.

Impact and weather resistant, with good high/low temperature performance and a service life that exceeds IEC 285, the SN 2000 is suitable for any application requiring reliable power.

From *Electronics News*, July 1986

RESULTS of the 1985 VK/ZL/O CONTEST

Greg Williams VK3BGW
WIA VK/ZL/O CONTEST MANAGER
1 Noorabil Court, Greensborough, Vic. 3088

OVERSEAS PARTICIPANTS

These are the DX results for the 1985 VK/ZL/O Contest. As mentioned previously, the conditions for the Phone weekend were terrible and slightly better for the CW Contest.

The standard of logs was very high and I thank all those who took the time to enter a log.

The purpose of this contest is for VK/ZL and Oceania stations to contact DX stations around the world and this would not be possible if DX station did not participate.

Call signs printed in **bold type** will receive an award and these will be posted shortly.

As this is my last VK/ZL/O Contest as Manager I want to thank all those who have helped me, and in particular, Jock White ZL2GX, the NZART Awards Manager, who will be doing the work for the 1986 Contest. So, remember to send your log to him at 152 Lytton Road, Gisborne, New Zealand.

MODE — PHONE

EUROPE *JAPAN*

CALL	BAND	SCORE	CALL	BAND	SCORE
OH7AB	*	3232	JE6MQW	*	33698
HB9ADO	*	2736	JA7YFB	*	30240
CT4NH	*	2470	JA9YBA	*	12980
HA7KLG	*	2016	JA2BNN	*	9504
DJ3HJ	*	2016	JH7LRS	*	5760
HA6NP	*	1950	JA7YCQ	*	5544
SP5PBE	*	1547	JA6BIF	*	4290
LZ2KIM	*	705	JA1RZN	*	3950
HB9IK	*	700	JE2IEO	*	3162
G3KSH	*	408	JA0URR	*	3100
LZ2JE	*	192	JA2YDC	*	2754
IV3YYK	*	98	JR3BOT	*	2268
YO3DC	*	96	JR1ZTT	*	1240
SP6CIK	*	84	JA4YPE	*	1092
SP6JZB	*	84	JI1WLL	*	1040
YO9HT	40	80	JA1AAT	*	546
HA4KYN	20	238	JA1BUI	*	504
OH6IU	20	160	JH3DEJ	*	192
PA0DJC	20	126	JE3CEC	40	4
PA0ZH	20	90	JA1BNW	20	160
SP5KVW	20	45	JA4GXS	20	70
			JA7FAS	20	40
			JA1OYB	20	8
			JA9ZGZ	10	2

NORTH AMERICA					OCEANIA
W0KEA	*	10710	KA3DRR /DV2	*	297440
					OTHER
W2FCR	*	286	HL1APR	*	1728
K6UO	*	180			

USSR					
UW0MF	*	12760	UM9MWO	*	468
UA0LCZ	*	12376	UT4UWK	*	280
UH8EA	*	11592	UR1RWX	*	180
UA9YX	*	10580	RB5QQ	*	152
UA0SAU	*	7488	UP1BWC	*	144
UZ0CWW	*	7448	UA0TO	*	108
UZ6LWZ	*	5070	UA9HTT	*	50
UZ0LWX	*	3304	UB5IFN	*	18
RA0FA	*	3060	UQ2HO	40	30
UQ2GM	*	2622	UV3CE	20	1710
RL8PYL	*	2120	UA9OO	20	480
UM8MO	*	1729	UZ9OWO	20	468
UP1BZZ	*	1320	UZ4WWB	20	340
UZ9UZT	*	1232	UZ3TWT	20	320
UZ0LWG	*	1080	UL7LW	20	72
UL8LWZ	*	986	RR2RU	20	50
UZ4FWO	*	740	UA3TG	20	12
UL8LWA	*	550	UZ9CYP	20	12
UB3IWA	*	510			

SWL — ALL MODE

VK J HAGAN	*	69372			
UP2 038 1580	*	9792	OK3 13095	*	528
JA0 KAMAGAI	*	5364	UT5 187 1	*	321
UA0 166 505	*	3904	NL 8992 R33	*	320
UB5 066 266	*	2714	UT5 186 100	*	280
UC2 006 43	*	1425	UA3 137 968	*	278
UA6 150 767	*	1320	ONL 383	*	54
UD6 001 220	*	1176	OK1 11861	*	40
WIA L30371	*	540	FE 3060	*	26

We thank the following stations for their check logs — HA4XX, RA4PC, RR2RX, SM6KMD, SM6OOI, UA3DJS, UA3XBB, UA9LT, UB4JO, ZL2BGO, ZM2AGY, ZM2ALF

MODE — CW

EUROPE

CALL	BAND	SCORE	CALL	BAND	SCORE
SM4CMG	*	3565	OK2QX	*	84
HA7KLG	*	2736	G5MY	*	75
HB9CJG	*	2300	EA2CR	*	72
HB9IK	*	1764	PI5PVI	*	72
LZ2KIM	*	1581	EA5CLO	*	70
OK1VD	*	1440	EA5CKP	*	48
SP5PBE	*	1377	LZ2HK	40	132
OH1TN	*	1140	EA7XC	40	60
DL1SV	*	884	LZ2JE	40	30
OK1MAW	*	862	OK1KOK	40	12
OH5PT	*	260	PA3BHS	20	48
OK2BSG	*	256	OH9PN	20	48
OK2BCI	*	234	HA5LZ	20	40
YO3CD	*	220	OE1TKW	20	40
G3KSH	*	208	OH7NW	20	36
OH3JF	*	204	OK2BWZ	20	30
EA2IA	*	180	OK2BMA	20	18
YO8DDP	*	168	OK2PMM	20	8
SP6CIK	*	84	PA3DKX	20	6
EA1AUI	*	84	OK1KZ	20	2
SP3LWU	*	84	OZ4OC	20	2

NORTH AMERICA					OCEANIA
W0KEA	*	8740	KA3DRR /DV2	*	164400
K3ZO	*	3600	YC2FEA	*	12768
					OTHERS
KF1Z	*	2288	LU1EWL	20	2
KA7T	*	660			
K2SX	40	252			

JAPAN					
JA7YFB	*	21390	JR4ISK	*	920
JE6MQW	*	18360	JA4GXS	*	900
JH7WKQ	*	11856	JA2YDC	*	896
JA0DAI	*	9400	JA2UOT	*	504
JR1ZTT	*	8400	JA1AAT	*	468
JA5EGX	*	8280	JA9YBA	*	336
JR3BOT	*	8148	JA7FAS	*	336
JA6BIF	*	7426	JA7KM	*	32
JR1IOS/4	*	4410	JA3YBF	40	1036
JA2PSV	*	4032	JR4SRW	20	630
JJ3JJL	*	3990	JA2KPV	20	616
JA6GU	*	3422	JO1OZI	20	418
JA7YCQ	*	3016	JK1LUY	20	320
JA2YMA	*	2900	JH3DEJ	20	90
JA8SW	*	2704	JA1VZM	20	64
JA1YAD	*	2500	JE2MDE	20	50
JR8OJZ	*	2164	JA1BNW	20	48
JA2DN	*	2070	JA0URR	20	36
JA1BUN	*	1120	JA1OYB	20	2
JA3ARM	*	1080	JA1YAG	15	100
JA7YFH	*	930	JG3SVP	15	12

USSR					
UZ0FWA	*	13440	UR1RWX	*	621
UZ0CWA	*	12295	UA4HNP	*	588
UA0SAU	*	11340	UT4UWK	*	572
UW0LT	*	11340	UJ8JA	*	442
UZ0CWO	*	8400	UB5TN	*	400
UZ0QWA	*	8190	RR2RW	*	352
RA0FA	*	7740	UR2RND	*	320
UZ0LWX	*	7538	UZ1TWB	*	300
UP1BZZ	*	6634	UB0IBC	*	286
UA0QO	*	6240	UQ2GA	*	274
UZ0CWW	*	6160	UA9CR	*	216
UH8EA	*	4896	RL7GA	*	198
UB4XWB	*	3920	UA3XBB	*	176
UZ0LWG	*	3654	UP2OU	*	154
UA4RZ	*	3630	UI9BWI	*	96
UA0ZPB	*	2929	UD6CN	*	84
UZ1AWI	*	2496	UT5UGR	*	72
UA9NN	*	2200	UA6YCI	*	70
UB4IZZ	*	1980	RZ3AM	*	60
RR2RU	*	1980	UB5IFN	40	140
UQ1GWW	*	1800	UF6FAL	40	24
RL8PYL	*	1480	RW3AN	40	24
UZ3AXH	*	1254	UB5IJA	20	462
UI9AWX	*	1200	UA3TCJ	20	442
UH9EWA	*	1152	RA3VM	20	380
UA9LDF	*	1120	UA0LT	20	320
UA6AF	*	1071	UA4LBF	20	231
RT4UA	*	1002	UA6LFQ	20	196
UA4WBV	*	992	UW6OE	20	154
UP2BIM	*	972	UQ2GLW	20	96
UZ4WWB	*	952	UA9WYL	20	18
UA6LLT	*	912	UL7CEP	20	12
UA6LCJ	*	896	UV9WR	20	8
UW0CM	*	832	UB5VK	20	8
UB4CWW	*	650	UF6DA	20	2
UA9WEE	*	640	UL7TT	15	2
UW3UO	*	630			

We thank the following stations for their check logs. HA0HG, OH2EJ, OH3MC, PA3BTH, RA3VO, RT5UO, SM0BDS, SM6OOI, SP2GOW, SP3AOT, SP4JWR, SP6CIK, UA0ABB, UA0LCZ, UA0LDO, IA0ZC, UA0ZDE, UA4HLD, UA4NBH, UA6PCH, UA9AU, UH8ED, UL7BY, VK8NE, YO6LV.

PLEASE NOTE: * denotes worked all bands

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G General *C* Constructional *P* Practical without detailed constructional information *T* Theoretical *N* Novice *X* Computer Program

CQ, June 1986 — VHF Special Issue. Classic Keys and Key Collections *(G).* Using Packet Radio *(G).*

RADIO COMMUNICATION, August 1986 — Cheap HB Power Supplies *(P : N).* Frequency Synthesiser *(C).* All Band Antenna *(P : N).*

WORLDRADIO, July 1986 — General World Amateur News. Dayton Hamfest. Hazardous Materials. Packet Radio. *(G : N).*

BREAK IN, June 1986 — Diamond Jubilee Conference.

QST, May 1986 — RF Measurement. Return Loss Bridge *(P).*

HAM RADIO, April 1986 — Grounded Grid Amplifier Parasitics *(T : P).* Satellite Communication *(G : T).* AC Line Transient Protection *(P)*

HAM RADIO, June 1986 — Core Permenaility and Current in Windings *(T : G : X).* Regulated Screen Grid Power Supply *(P).*

ar

HEAT-SHRINK SLEEVE MARKING

A new system has been released for applying permanent marks to heat shrinkable sleeving using standard equipment.

The HSI system uses an irridated polyolefin which is flattened and then bonded to A4 size paper for marking by the user.

The paper is fed into a standard typewriter and marks can be typed as needed directly onto the sleeving, or alternatively marks can be scribed onto the sleeving with the use of a permanent marking pen. Once marked HSI is then cut, removed from the paper by hand and heat shrunk (2:1 ratio) on the cable in the usual way.

Nine widths of sleeves are available from 1.6 to 25.4 mm diameter. The layout of HSI on the sheet allows random selection of marks for rapid ease of use.

Adapted from *Electronics News*, p33 — April 1966

International News

FROM HOLLAND

The following is a report of a meeting between the Radio Communications Branch *of the Dutch PTT, the* VERON *(official amateur organisation),* VRZA *the second unofficial amateur organisation) and* NCV *(a splinter-group, but recognised by PTT, VERON and VRZA). It was published in* Electron, *June 1986 and translated for* Amateur Radio *by John Aarsse VK4QA.*

NCV announced that it is in liquidation and will not be represented anymore at the half-yearly PTT/ amateur meetings.

CEPT Licensing

CEPT is the European organisation of PTTs. The Dutch PTT announces that it will introduce simultaneously with the new Dutch licensing system a CEPT licence applicable to the Netherlands. It will be a publication announcing that amateurs from other CEPT countries with recognised licenses will be allowed to operate in the Netherlands for short periods without applying for a Dutch visitors licence. (Grade A, Grade B "full" licenses and Grade C (equal to VK limited licenses).

Dutch amateurs will receive a new registration card containing, in several European languages, a declaration indicating the appropriate licence the bearer has been issued with. This document will be valid in those countries who have adopted the CEPT licensing system.

50 MHz Operations

CEPT has discussed opening 50 MHz to amateurs. The UK is the only CEPT country permitting amateurs to use part of the 50 MHz band (with restrictions). France, Switzerland, Norway and Sweden are sympathetic to the amateur use of this band but will not allow it for the present. It is therefore expected that a solution will not be found before the year 2000. VERON asked if specific experiments could be conducted when the sunspot cycle was going up again. The Chairman said that the answer will not necessarily be "no."

Unmanned Stations

The new proposed licensing requirements will insist that unmanned stations will need a special licence.

Up until now repeaters needed separate and special licenses. The new proposals will allow such a station to be part of an individual station licence (private or club) and no separate request has to be made.

It will be necessary to identify such stations with a special prefix. The suffix can be issued, if possible, as the applicant prefers.

Such licenses will initially be valid for one year. Continuation of experiments is possible but will require a new application.

Before an application is considered, consultation will take place between the PTT and the two amateur organisations.

Following are tentative suggested prefixes.

Two metre repeaters	PI3
70 cm repeaters	PI2
Linear ATV repeaters	PI6
Beacons	PI7
Mailbox stations	PI8

Subsequent discussion results in PTT agreeing that all applications will be handled by the two organisations, a situation already in existence with regard to present repeaters.

PTT will not determine, in principle, power, etc of proposed stations. The two organisations decided to co-operate, within IARU 1 recommendations, to determine power antenna heights and antenna gain.

Regarding indentification, it will be allowed that an unmanned station will transmit no more than four times an hour the call sign followed by a possible traffic list (mailbox). It is not clear if this is the correct approach.

—Reprinted from *ELECTRON*, June 1986 and translated by John Aarsse VK4QA

INTERNATIONAL TRAVEL HOST EXCHANGE

Following is an additional list of amateurs who are participating in the International Travel Host Exchange Program. (See initial list page 43, August issue.

Belgium
Jean Fagnoul ON1KFN.

Canada
F H Prouse VE3PEJ, Carlton Sole VE3GHT, Bob Kane VE3KUG, Ross Carr VE6FG, Neil Smith VE6AZA, and William Giesbrecht VE7FRR.

Germany
Johannes Amchewicz DK8JB.

Greece
Agis Sarakinos SV1ACS.

India
M S D C Radharaman VU2RAD and G D Gopal VU2GDG.

United States of America
Dave McCurdy N1DLS, Mr and Mrs Garry Bartels KJ4KM and KB4TGC, Robert Blumberg AA4U, Mr and Mrs Richard Genaille W4UW, G E McGrede N5JDM, Mr and Mrs Ken Hopkins WA9WCP and KA9EFE, Mr and Mrs Karl Pruett WA0NPK, and Harvey Stadick KA0GBJ.

HIGHEST MEMBERSHIP IN JAPAN

Due to a membership promotion campaign in November and December, last year, the Japanese Amateur Radio League has, as of February 7, 1986, a total of 136 369 members, which is the highest in the history of the League.

—From *Region 3 News*, April 1986

BOTSWANA'S 20th INDEPENDENCE ANNIVERSARY

To celebrate Botswana's 20th Anniversary of Independence, the Botswana Radio Amateurs have been permitted to use the following Special Event Call Signs, during September and October 1986.

Full Licensees will use the prefix 6O2
Novice Licensees will use the prefix 8O0

BARS members, including SWLs and other Botswana active radio amateurs are being issued with QSL cards.

—Contributed by Gerold Tjarks A22TJ/8O2FTJ
Secretary BARS

FASTEST MOS CHIP!

A new silicon MOS chip, believed to be the fastest practical chip to date has been tested at speeds of up to three gigabits per second — fast enough to use in high speed fibre optic transmission systems.

This silicon chip shows that silicon can be used for gigabit-per-second logic circuits, and silicon offers higher yield, lower cost, and higher levels of integration than gallium arsenide.

Most importantly, the circuit consumes little power.

The multiplexer chip has 200 logic gates and dissipates only half a watt of power whilst the de-multiplexer ship has 400 logic gates and dissipates 0.75 watts. Both chips are 2 mm².

The chips were designed in 0.75-micron NMOS technology and feature channel lengths as small as 0.5 microns.

The multiplexer accepts 12 parallel input channels and, using time-division multiplexing, generates a multi-gigabit-per-second serial output. The de- multiplexer performs the reverse operation.

The propagation delay in each gate on the chips is only 150 pico- seconds.

Abridged from *Electronic News*, p4 — April 1986

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

OCTOBER

4- 5	VK/ZL Oceania Phone Contest (Rules August issue)
4- 5	IRSA World Championship
11-12	VK/ZL Oceania CW Contest (Rules August issue)
-12	RSGB 21/28 MHz SSB Contest
15-17	YLRL Anniversary CW Party
-18	RSGB 21 MHz CW Contest
18-19	1986 Fall CW Contest (Rules August issue)
18-20	CARTG RTTY Contest
25-26	CQ WW DX Phone Contest
29-31	YLRL Anniversary SSB Party

NOVEMBER

- 8	Australian Ladies Amateur Radio Association Contest (Rules September issue)
8- 9	European RTTY Contest (Rules August issue)
—15	AHARS National CW Sprint (Rules this issue)
15-16	Oceania QRP CW Contest
—22	AHARS National Phone Sprint (Rules this issue)
29-30	CQ WW DX CW Contest

DECEMBER

—13	Ross Hull Memorial VHF Contest begins

JANUARY

— 5	Ross Hull Memorial VHF Contest concludes

VK NOVICE CONTEST 1986

Well, I wonder if there is any truth in the rumour that a niche is being built in the wall of a shack in the south-east of South Australia into which the Novice Contest Trophy can be cemented. It certainly appears that Don VK5NOD, intends to try something along those lines as he has emerged as the top scorer in the *VK Novice Contest* for the third consecutive year.

I guess that by his actions, Don is really throwing out a strong challenge to all to try and wrest the trophy from him. Our heartiest congratulations go to Don for his fine effort. To win the contest this year, Don increased his composite Phone/CW score by 304 points. This may have been helped by the fact that there were 87 entries in this contest an increase of 28 over last year's effort. This is rather pleasing.

There could be various reasons for the increased interest, however I feel that one major factor is the change of time of the contest to the month of June. Most comments point to the fact that it was a very enjoyable event.

Again there has been a fair amount of criticism at the lack of Novice stations operating using the CW-mode. The number of logs submitted for this section increased from four last year to 11 this year, which is certainly a marked improvement. I would like to see this rate of improvement maintained as I know that if more operators try the CW mode in a contest they will find it rather enjoyable and not really difficult. Contest operation is nothing like *rag-chewing*, particularly where CW is concerned. So, I suggest that you try it for yourself and find out just what I really mean. You may also care to review the comments included with the results of the 1985 VK Novice Contest dealing with this same subject. I have received little feedback from them.

Mention must be made of the fine effort put in by VK4VAT in running a close second in the overall points and a special mention is warranted for VK2PYM, who came second in the CW section in his first contest ever, certainly something to be proud of. Perhaps we might see the VK2PYM call sign way up in the CW sections of other contests in the future.

In general, logs were of a good standard, however, some operators left it to me to score their logs for them. It was also not apparent to some that a separate log was necessary where both phone and CW entries were made.

On the subject of logs, I would like to draw attention to the efforts of Len VK3NLS. I know that Len will not mind me telling this story now, well after the event. Several years ago, I entered into some correspondence with Len due to the fact that his log for a particular contest was definitely not acceptable. Well, I can certainly tell you that in this contest, as well as others, he has submitted a log which cannot be faulted in any way. As well, he has provided additional help by including complete sorting of the log in order of call signs, etc. Yes, Len's log was computer generated but, as I said before, it was immaculate. I suggest that if you want to find out how to make an excellent log, VK3NLS is the person to approach for advice.

Individual scores for the 1986 VK Novice Contest are as follows:

PHONE/NOVICE

VK5NOD	971	VK2NNK	499
VK4VAT	815	VK5KCX	331
VK7NCP	778	VK2JAM	299
VK2NAN	768	VK2PYM	227
VK3NLS	730	VK6NTJ	221
VK7NAI	596	VK3PJP	204
VK2NXA	594	VK6NSH	194
VK3KRL	557	VK3NBN	133
VK3VAS	504	VK7NBF	107
VK5NTT	502	VK3VOJ	83

CW/NOVICE

VK4VAT	135	VK8NBC	37
VK2PYM	127	VK3VAS	12
VK2JAM	110	VK5NTT	10
VK3NLS	76	VK3KRL	10
VK5NOD	72	VK6NTJ	4
VK7NBF	59		

PHONE/FULL CALL

VK3EW	1498	VK3CLS	209
VK5SJ	1343	VK6QS	170
VK2CXX	700	VK2DQP	168
VK5QX	620	VK3ZI	146
VK5ATU	591	VK6AFW	122
VK3DOM	582	VK3CGG	113
VK3YH	530	VK3XF	109
VK2AKP	504	VK5AGX	69
VK4OD	419	VK3DBQ	65
VK3BJN	395	VK6ED	64
VK2BOS	311	VK1RH	57
VK1LF	297	VK3KS	20
VK2RJ	247	VK3XB	15
VK2SA	213	VK5GZ/8	39

CW/FULL CALL

VK3CGG	249	VK6AFW	64
VK3NK	155	VK4TT	49
VK2PS	139	VK3XB	46
VK4OD	113	VK5QX	34
VK2DQP	94	VK3XF	27
VK4AOR	90	VK3KS	22
VK5AGX	88	VK2CXX	21
VK3CMZ	80	VK6QS	18
VK2AZR	78	VK5ATU	2
VK2RJ	72	VK5GZ/8	2
VK4BRZ	70		

PHONE/CLUB

VK3IE	949	VK3SCD	314
VK2IYP	377	VK4BPA	284

SWL

L20282	751	L30371	87

CW/CLUB

VK3IE	140

CHECK LOGS

VK2JGR	VK2LE/P
VK4BA	

Incidentally, an interesting aspect regarding this contest has surfaced. A telephone call from Don VK5NOD, provided the information that the VK Novice Contest Trophy, which is in the form of a plaque, has the call signs of each winner engraved on it against the year in which the trophy was won by that operator. Don pointed out that in each case the "year" shown on the trophy is incorrect. I have asked him to forward the trophy to me so that I can look into this matter. It does seem as if it may be necessary to have the trophy re-worked with the engraved section replaced with the correct information.

I would like to express my thanks to all the contestants who entered this years contest and thus helped to make it a much greater success than in the past. I would also suggest that, as it is our annual "Novice" contest, it should be provided with much more support by our Novice operators in the future.

Some of the comments provided with logs submitted this year are as follows:

"Most activity I've heard on any VK contest except RD. Very friendly — almost everybody was happy to stop for a chat . . ."—VK3CRA operating VK3SCD/P

"Do not agree with VK7NBF's remarks re overcrowding in the novice CW segment. The novice CW 3.525-3.535 segment is NEVER overcrowded. There is always room for *at least 10* more novices than I ever hear at any one time."—VK3XB

"Entry submitted in appreciation of your efforts over the last few years, will be again interesting to see if the novices appreciate your efforts, but I doubt not — my log speaks for itself."—VK4BRZ

"I was a little bit disappointed in the lack of contacts with novice operators, I manned the station for as long as practicable, having regard to my age (70 years), I also noted that most operators with AOCP privileges used full power, perhaps overshadowing the novice operator. I maintained 10 words par minute and regret to say that some replies were well in excess of the speed set down in the rules."—VK3CMZ

"Good contest. More stations on than last year. 15 metres very poor. 10 metres nil heard."—VK1LF

"Usual sporadic operation as is my norm these days. There seemed to be more novices again this year, especially "N" series . . . the stint on Saturday night was on the FT7 in the study . . . I will say the study has advantages this time of year — about 15 degrees Celsius advantage."—VK2BQS

"This was the first time I have been on the air and I thank you for providing the necessary incentive to make that first call."—VK3VOJ

"Some full call operators complaining about how they held certain frequencies for the duration of the contest, even when channel clear for three minutes, many complaints about my loud signal, suggest they learn about antenna building, and move to a big hill!"—VK5KCX (What about an antenna article for AR, OM —Ed)

"Contestants should be encouraged to use the phonetic alphabet at all times . . . the practice of stations using non-standard phonetics (A: America, L: London, Z: Zanzibar, etc) is not only annoying it could also lead to errors in call signs in less than optimal operating conditions. It should be strongly discouraged."—L20282 (You may well have a good point there Greg. The phonetic alphabet accepted for use these days has been specially planned to obviate errors in understanding —FCM)

"I found the contest, at times I was able to operate in it, most enjoyable and very friendly."—VK4CE/VK4BA

"I enjoyed operating in this years comp, everyone seemed to enjoy themselves. Thank you tor your time and trouble, Ian."—VK3YH

"This year I enjoyed it more than last year and found that the majority took heed of your requests regarding speed and power used. Unfortunately, I was called by the Police Rescue Section to participate in a marine emergency in Bass Strait (on 27 MHz) losing a couple of hours on Saturday night. When I got back, 3.525 to 3.535 MHz was occupied by a couple of broadcast stations of oriental origin. On Sunday afternoon, the same frequencies were occupied by two pairs of Japanese fishing boats. Life was not meant to be easy. HI. Thank you for organising the contest."—VK7NBF (Sounds like you might have an interesting story to tell about emergency operation, Bob. How about writing something for *Amateur Radio* magazine? Also, you could consider putting in reports of intruders to your IW Co-ordinator. I am sure he would appreciate them. —FCM)

"Best thing over done — put this contest on at this time of the year — no QRN. I was asked twice how does one score for K and J calls — I advised to treat as novice calls which I think is correct. Perhaps this point should be put in future rules. Propagation was no good on 10 and 15. Where were all the VK1s — after the RD contest they must have retired? !"—VK4OD

"I was amused by some of the excuses I was given by phone operators for CW contacts. For example — no key; key plug behind rig; no CW filter; no practice (but will be); only one log sheet used for phone only. Not one gave the real excuse which I would have accepted, or maybe the best excuse was that they were too busy, but I was not calling phone at busy times."—VK3CGG

". . .rather a restricted one in regard to time restraints due to shift work requirements, plus a lot of QRN/QRM,

especially on 80 — lots of broadcast stations blocking out svsryone ... However, better luck next year I guess."—VK8NBC

"The 80 metre band from Darwin has been better on other nights. Power line noise bad for contest. We hear a lot more rubbish than amateurs on this band than what I hear in VK8. All the novices on 15 metres were not really in the contest, at least I made an effort, Ian."—VK8GZ/8

"On what was only my 12th contact since becoming licensed a CQ from VK3KLE, I heard about the contest and he kindly took the trouble to explain the workings to me. And lo, another 34 contacts that I enjoyed and from a good deal of the country. And much learned. Spoiled a bit by full call stations occupying most of the band and taking advantage of their extra power but I think it has been worse in the past and perhaps new rules have improved the situation. My first experience. Much enjoyed."—VK3NBN

"We attach the log of the St George Amateur Radio Society for the activation of the Society's call sign VK2LE/P ... This will undoubtedly receive the log of the other Society call sign VK2IYP in the near future ... The contest appeared to be an amazing success and enjoyed by all who participated. We were glad to have been able to activate the two St George Amateur Radio Society call signs for the contest."—VK2AXS

NATIONAL CW AND PHONE SPRINTS

This month we announce a new and innovative approach to the subject of on-air competition. This is the implementation of two very short "sprints" or "scrambles", one for phone and one for CW to be held in November.

As Federal Contest Manager I have expressed strongly my opinion in the past regarding the fact that there are too many contests run on our bands. Further, there has been a large body of opinion to the effect that contests should be fairly tightly restricted as far as frequencies are concerned. In this instance, the approach adopted by the Adelaide Hills Amateur Radio Society Incorporated, has quite a deal to commend it.

I present the rules for these events at the same time pointing out to you quite clearly that these competitions are not organised by me as Federal Contest Manager. I am simply providing some publicity for them.

The Sprints are a suggested annual event, however if sufficient interest is shown, consideration could be given to running these short competitions on a more frequent basis. You could let me know what you think of this idea which is certainly a new approach to competition on a national basis in amateur radio in Australia.

I have often entered Scrambles at various conventions and have always found them to be good fun. It seems to me that the rules adopted ensure that there is a frequency restriction applied, (one band only), as well as a time restriction. (One-and-a-half-hours duration). As such, there is a very good possibility that the idea will appeal to many of you who would not otherwise enter into contests at any time. Full details are provided below.

REMEMBRANCE DAY CONTEST

This material is being compiled just one week before the Remembrance Day Contest. I am looking forward to entering same and hope that I will be able to exchange serial numbers with many of you. It will be rather interesting to see just how long it is going to take for the Weighting Factors to change due to Divisional Activity to a degree where they will produce a change in the results. Maybe even this year we will see one of the Divisions make some kind of an effort to improve their score and bring about yet another change. Personally, I am not completely happy with the current approach as I mentioned in my report to the 1986 Federal Convention. I believe now that only a lengthy time period will indicate the true effects of the current system. No doubt, you will have read the comprehensive article written by Ron VK1RH, on the subject of Remembrance Day Contest Scoring and perhaps studied the graphs of activity over the years. I would like to express my personal thanks to Ron for his efforts and also for undertaking the calculations needed to determine the weighting factors to be applied to the Divisional scores. I hope that we will all have had a most enjoyable time operating in this years Remembrance Day Contest. By the time you read this I will no doubt be inundated with all the logs that have come in.

ROSS HULL CONTEST

Next month, I will be providing details of the rules for the Ross Hull Memorial VHF Contest. Again, quite a few changes have been made in an attempt to even out the competition and provide a more universal appeal.

Depending on the results, a decision will most definitely be due as to just what will need to be done about this contest. Up until now I have not received much in the way of feedback from the Discussion Paper, which was circulated to each of the Divisions in May. So far, only two Divisions have provided anything in the way of comment. Now, I wonder whether there is really any interest at all in this contest. Sometimes, I am inclined to think that I am perhaps just being ignored. It is a lonely feeling at times although I can console myself with the thought that if I don't hear from anyone it is not really due to apathy but rather that I must be getting things right and thus I am left alone. I wonder what the true story really is? ? ?

VK/ZL CONTEST

I expect that you have noted the different approach to the time period for the VK/ZL Contest in the rules provided by Jock White ZL2GX, this year. In discussion with Jock on one of our regular scheds, he informs me that the basic idea is to make the contest more attractive for those who cannot spare the full 24 hours for operation and also to encourage more activity. There will certainly be some strategic advantage in knowing just when which band is likely to be open. Yet again, we may see some changes from the usual pattern of the same stations coming up with the top scores year after year. Or will we?

GENERAL CONTEST INFORMATION

From time-to-time I am asked by individual operators for basic information as to how one goes about entering into contests. I also receive suggestions along the lines of running a separate section in the notes for beginners.

There is some merit in such things, however, it is also necessary to explain a little with regard to the production of these notes and the limitations brought about by the nature of our magazine. Some of the problem comes about due to the lack of time available to me to sit down and write up separate material for this column. I have to try and keep up to date in the matter of contests and information which needs to be disseminated as currently as possible. Next is the fact that not a lot is to be gained in going over old ground. There will always be newcomers to the scene, and I am as keen as anyone else to encourage them in their activities. Most operators who are interested in trying out in the contest arena will be able to find some friendly operator to either explain in person or over the air, just how to go about starting in this type of activity. Then again, it is possible that they can gain more information by looking back over old issues of *Amateur Radio*.

When I became Federal Contest Manager a few years ago, I did go to the trouble of producing a series of articles as part of these notes. These articles covered a wide range of topics such as: setting up your station; operating in field day contests; preparing logs and check sheets (including examples); planning your operating and tactics as well as providing general hints designed to help in making your contest operations more enjoyable.

Maybe you could review these articles if you are unsure as to what you need to do in entering contests. (It also occurs to me that I could polish them up just a little and ask the editor if he would be prepared to reprint them as a series on contesting. To do this however, I will need to find some time over and above what I have available at the moment).

Still, I do hope that I am making a useful contribution to the hobby and I still welcome any suggestions which you may have to help improve this column and its presentation. Meantime, while I try and do something about these matters, you may try and find those back issues. Look for them from about the August 1984 issue, onwards.

Meantime, I again wish you all the best in your activities and trust that you will enjoy the various events coming up in the future.

—73 de Ian VK5QX

NATIONAL CW AND PHONE SPRINTS

The Adelaide Hills Amateur Radio Society Inc, is delighted to announce the inaugural National Sprints, a pair of "quickie" contests for CW and phone operators, to be held during November 1986. The National Sprints will be similar in nature to local scrambles, but nation-wide participation makes them something new in Australian contesting. The National Sprints are endorsed and supported by the South Australian Division of the Wireless Institute of Australia, which will provide certificates and trophies.

The reasoning behind the National Sprints is this — there are too many "big" contests each year; they require a lot of time and the rules are complex, thus discouraging many operators from participating. The National Sprints are short, sharp and simple, requiring a minimum of time while providing a significant operating challenge.

Object of the Sprints

The operator's basic goal in the Sprints is to make as many contacts as possible (without duplication) during an hour and a half of operation on a single band. Any contact on 80 metres during the Contest Period including DX, can be counted, but a station may only be claimed once.

Eligibility

The National Sprints are open to any licensed amateur or group of amateurs using a single call sign; eg club stations, anywhere in Australia (VK call areas).

Contest Period

1200-1330 UTC November 15, 1986 (CW Only)
1200-1330 UTC November 22, 1986 (Any legal phone mode)

Frequencies

For the CW Sprint, frequencies between 3.500 and 3.700 MHz may be used.
For the Phone Sprint, frequencies between 3.535 and 3.700 MHz may be used.

Regulations

Irrespective of any provision contained in these rules, operators are reminded that they must operate in accordance with the terms and conditions of their respective licenses and applicable regulations.

CONTEST CALLS

CQ Sprint or CQ Test or CQ Contest.

EXCHANGES

Minimum exchange for a valid contact will consist of signal report and a three digit serial number. The serial number may start at any number between 001 and 999, but will revert to 001 if 999 has been reached.

Logs

Contest logs must show for each contact the time (UTC), call sign of station worked, report/serial number given and report/serial number received. Each log must be accompanied by a cover sheet showing the date and name of the Sprint (CW or Phone), the total number of contacts claimed, and a statement that the operator has abided by the rules of the contest, signed by the operator/s. Any special conditions such as QRP or mobile operation should be mentioned in the statement.

Logs are to be in the hands of the Society no later than Friday, December 5, 1986 and can be addressed to:
National Sprint Manager, c/- AHARS, PO Box 401, Blackwood, SA. 5051.

Awards

Certificates will be awarded to the highest scorer in each Australian call area for both the CW and the Phone Sprints. Trophies will be awarded to the outright winner of each Sprint.

Certificates may be awarded to other operators whose performance was, in the opinion of the organisers, exemplary.

Any entry which is patently in violation of the rules or spirit of the Sprints, or which contains an excessive number of claimed duplicate contacts (this does not refer to duplicates which have been indicated as such and are not claimed), may be disqualified.

The decision of the Society' in respect of the interpretation of these rules, granting of awards, or disqualification will be final.

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COMMONWEALTH CONTEST 1986

According to some of the pundits, Cycle 21 has finished and we are again on the way up. The number of VK entrants in this contest seems to be very much tied in with conditions, the members in the last three years 84-66; 85-58 and bottoming

this year at 52, (but still a very respectable total), the turn-up must have taken place sometime after the second weekend in March! Few VKs would have labelled the conditions during the contest as even 'fair.'

However, though the outright winner scored only 250 odd points more than the year before, Russ Coleston VK4XA, improved his position from eighth to fifth, and scored 630 points more than in 1985. As will be seen from the table below, only 150 points separated the top three, 6Y5HN, making the highest number of QSOs, 471; VE3BVD 416; VE6OU/3 400; while Russ made 276. In the race for bonuses, VE7CC was top at 155, G3FXB 141, and Russ 133.

Though not so many ZLs seemed to be operating as in 1985, there were at least a few — it was disappointing that only three of them appear in the results.

In the Receiving Section, Eric Trebilcock made it four in a row winning by 105 points over his old adversary, BRS 1066.

TOP TEN

1. VE3BVD	4550	6. G3FXB	3945
2. 6Y5HN	4414	7. G3PEK	3555
3. VE7CC	4400	8. VK2BQQ	3517
4. VE6OU/3	4139	9. G3MXJ	3468
5. VK4XA	3991	10. ZL1AIZ	3462

RECEIVING SECTION
1. Eric Trebilcock BCRS 195 2200

AUSTRALIAN SCORES

5. VK4XA	3991	60. VK2EL	1342
8. VK2BQQ	3517	64. VK3KS	1275
11. VK2AYD	3460	66. VK4BSQ	1265
13. VK3MR	3302	67. VK8HA	1250
14. VK8LW	3295	69. VK7RY	1204
21. VK7BC	2895	71. VK2SU	1162
23. VK3AUQ	2680	74. VK4TT	1115
26. VK4APZ	2585	79. VK6AJ	1040
27. VK3DQ	2517	80. VK3DOV	1036
28. VK6IT	2509	82. VK5BS	987
29. VK2ZC	2501	89. VK3XB	792
30. VK5AGX	2474	90. VK3RJ	785
31. VK2AQF	2412	91. VK6ED	770
32. VK5BN	2351	92. VK2AZR	758
33. VK5UM	2350	93. VK5RG	749
33. VK6HQ	2350	94. VK4BKM	745
36. VK4XW	2302	95. VK3XF	732
40. VK2BAT	2025	96. VK6AUX	724
44. VK3BDH	1892	98. VK4SF	665
45. VK2DID	1860	99. VK7ZO	640
47. VK5GZ	1735	102. VK3FC	582.
49. VK2APK	1727	104. VK6RZ	560
50. VK3MJ	1687	106. VK2GT	550
51. VK3ZC	1685	121. VK4RAN	235
55. VK7CH	1535	121. VK4NUN	235
57. VK6RU	1464	124. VK2HC	202

Single-band entries among the above were:
3.5 MHz VK3XB Overseas Leader, VK4NUN
7 MHz VK2APK Overseas Leader, VK3FC, VK6RZ
14 MHz VK3KS Overseas Leader, VK3RJ, VK4BKM, VK4RAN, VK4TT, VK6AJ, VK8HA

Congratulations to Ivor and Mavis Stafford who took out two of the single-band awards using their joint station — apparently Ivor on the air while Mavis was in the kitchen!

PACIFIC AREA SCORES

10. ZL1AIZ	3462	38. ZL1HV	2134
15. P29PR	3287	48. ZL2TX	1730
17. T30AT	3187	81. P29FJ	990
22. 9V1TL	2775		

VK TEAM EVENT AND AWARDS
New South Wales comfortably retained the four man team title, defeating VK3 by 1500 points, with VK4 third.

Comparative totals for the past five years are as below. The UK, had they been in the competition, would have won, hands down, four years out of five.

	1986	1985	1984	1983	1982
VK2	11890	10632	16272	10487	13450
VK3	10391	8784	14549	13062	15813
VK4	10143	8359	12475		
VK6	9618	6482	10303	6776	9748
VK5	8910	8761	8965	6822	7760
VK7	6274	7982	7571	5199	9865
G	14408	13193	17064	10872	20384

AWARDS
The Gold Medallion for the leading VK entrant was won by ***Russ Coleston VK4XA.***

The Silver Medallions for the leading State Team were won by ***K Nad VK2BQQ, D Pilley VK2AYD, Jim Cowan VK2ZC*** and ***E Carruthers VK2AQF.***

HOW THE LEADERS MADE THEIR SCORES
QSOs/Bonuses per band 80-10 (claimed).

VE3BVD	59/23	114/51	223/35	20/20	
6Y5HN	37/15	144/38	223/35	22/12	1/1
VE7CC	37/29	86/45	102/52	44/29	
VE6OU/3	23/17	119/43	237/32	21/21	
VK4XA	34/19	87/36	120/40	46/29	9/9

The adjudicator, Alan Gray G4DJX, has produced, through his computer, a very interesting series of tables covering the results in each of the main geographical areas of the Commonwealth. Of course, these are only in respect of those who submitted logs, so the overall totals would in fact be greater — 13405 QSOs were made in the 24 hours, 7103 bonus areas worked, 31 unmarked duplicates were noted (22 of them on 14 MHz) and a total of 204 020 points were credited. Our 52 entrants were the most from any one country, but the Gs are creeping up, to 46.

The table below shows the number of suffixes per call area per band, worked by stations outside the UK. By next year we will have a similar table showing the same information as worked from VK.

In the rare area class were ZL4 (!) worked by one VK, and VE2, VK1 and ZB2 worked by two VKs.

CALL AREAS WORKED FROM OVERSEAS

	BANDS					
AREA	3.5	7	14	21	28	TOTAL
A2		1				1
A3	1	1	1	1		4
G	67	175	340	150	3	735
P2	1	2	3	2	1	9
T30	1	1	1	1	1	5
VE1	8	13	14	6		41
VE2	3	3	7	2		15
VE3	13	36	39	16		104
VE4		3	5	1		9
VE5	4	5	5	2		16
VE6	1	2	5			8
VE7	2	9	13	7		31
VE8		1	1			2
VK1	1	1				2
VK2	9	18	22	16	4	69
VK3	15	23	23	11	4	76
VK4	8	9	11	6	1	35
VK5	6	11	12	5	2	36
VK6	6	12	12	10		40
VK7	6	7	6	5	1	25
VK8			2			2
VK9N		1				1
VO1	4	5	3	2		14
VP2M	1	1	1	1		4
VQ9	1	1	1	2		5
VS6			3	2	1	6
VU		6	9	1		16
Z2		2	1	1		4
ZB2	1	1	1	1		4
ZC4		3	3	1	1	8
ZD8			1			1
ZL0		1	1			2
ZL1	6	14	10	8	3	41
ZL2	3	6	9	4	1	23
ZL3	1	1	1	1	1	5
ZL4		3	1		1	5
3D2		1	1	1		3
3D6	1	1	1	1		4
5H		1	2	1	1	5
5N		1	2	2	1	6
6Y	1	2	2	1	1	7
8P		1				1
8R		1				1
9H		1	1			2
9J	1	1	2	1	1	6
9V	1	1	1	2	1	6
AREAs	28	43	41	34	19	
SFXs	173	389	579	274	30	

A total of 46 Call areas were worked.

RSGB COMMENTS
If you are looking for a contest to enjoy, work DX, and make many friends, then this is the one. It could also be a very profitable one if you are to believe the rules as published in the Australian magazine *Amateur Radio* which stated that "each completed contact will score five pints." ! ! ! As Kev Phillips VK3AUQ put it — "the rules say I can claim five pints per contact, so I should claim for 745 pints or 93 gallons and one pint." Well Kev, I've heard that Aussies are big drinkers but could you really cope with that amount of alcohol? ? ?

There were 126 entrants who made a total of 13405 QSOs including 67 on 28 MHz — an improvement on last year. Although conditions were slightly better many stations still struggled to make contacts; the thrill and excitement seems to lie in the challenge to dig out those call areas from the noise and QRM. Perhaps it is the gentlemanly (apologies to the YL operators) operating with many stations using the contest to keep in touch with old friends, which makes it so much fun. Even though there are many OTs — some in their 80s — who regularly participate, it is by no means an old mans' contest with many youngsters on the scene making a challenge for the honours; eg, VK6LW, G4BUO.

This years winner is David Dudley VE3BVD, who made an impressive 4550 points from 416 QSOs and receives the Senior Rose Bowl. David used a TS830S, plus an MLA 2500 feeding 80 metre phased verticals, 40 metres three element, two element Yagi, 20 metres six element, four element Yagi and 15 metres five element, five element Yagi.

Second for the second year running is Nigel Hoyow 6Y5HN, who made 4414 points from 471 QSOs using a TS180S plus SB201 feeding 40/80 metre trap inverted Vee dipoles at 30 feet (9 m) and a four element beam at 33 feet (10 m). Last years winner, Lee Sawkins VE7CC, came a very close third at 4400 points from 268 QSOs using a TS820S plus LB4 feeding an 80 metre sloper array, 40 metre two element Yagi at 100 feet (30 m), 20 metre five element Yagi at 105 feet (31 m), and 15 metres four element Yagi at 90 feet (27 m). Al Slater G3FXB, returns as the number-one UK entrant winning the Col Thomas Rose Bowl with 3945 points from 235 QSOs and used a T4XC/R4C combination with 80 metre slopers, three element and two element Yagis and quad loop on 40 metres and a 20/15 metre quad.

Eric Trebilcock wins the Receiving Rose Bowl in his 46th Entry. Mention should also be made of the efforts of Russ Coleston VK4XA, who leads the Australian entry for the seventh year in succession.

Congratulations to all the trophy winners, and to all who received certificates.

The Australians had an impressive turn out, the *only* disappointment being the lack of VK1 activity. VK8HA, despite his other commitments, managed to provide many with a sought after call area.

T30AT was a welcome sight to most but was not heard here in the UK, but the UK does hold the advantage when it comes to working Africa.

In all some 53 call areas were worked — again an increase on last year. There were reasonable 20 metre openings from the UK to Oceania at the start of the contest with Canada and Africa appearing later. The 15 metre band was in good condition to Africa on both days but was very poor to other areas. For a very limited period 10 metres was open.

Only two entrants from the UK made a contact with 9J2BO who was 559 at 1444 UTC. There was little HF activity during the night. The 40 metre band was fair, being open to all of Oceania, with Al Slater contacting 28 call areas — obviously those beams work! But 80 metres was disappointing and only Barry G3PEK made any real impression with his vertical and extensive radial system. ZL3GQ was particularly loud on any band! Once again it is those stations who have a good knowledge of band conditions who can make the most out of this contest. Unfortunately for the VK contingent, storms off two coasts produced high noise levels which made reception difficult especially on the LF bands which could be why modest set ups failed to produce results this year.

With the *Golden Anniversary* next year, the RSGB are making some special arrangements to celebrate one of the oldest radio contests in the world. Full rules, with details of the arrangements will be published later.

Make a date *in your diary now for* the second full weekend in March next year — something not to be missed! I

Many thanks to the following stations who sent in check logs:

G3CXM, G3GMM/A, GW3JI, G3OZF, G3WP, G6NK and VK3KF. Special thanks to John Tutton VK3ZC, for his invaluable help in promoting the event "down under." —G4DJX.

—Contributed by John Tutton VK3ZC

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FIRST IRSA WORLD RADIO CHAMPIONSHIP

Phone: Saturday, October 4, 1986, 0000 to 2400 UTC.
CW: Sunday, October 5, 1986, 0000 to 2400 UTC.

Single operator stations may operate no more than 22 hours out ot the 24 hours on each mode. A minimum of two hours rest time may be taken in one or two rest periods. All multi-operator stations can operate for the full 24 hours.

Objectives: For amateurs around the world to contact other amateurs in as many countries as possible. All contacts with fixed or mobile licensed amateur radio stations around the world, including own country, count.

Bands: 1.8, 3.5, 7, 14, 21, 28 MHz.

Number Exchange: Signal report plus the consecutive QSO number starting with 001. (59001 phone and 599001 CW).

Points: Each correctly sent exchange is worth one point, each correctly received exchange is worth one point on phone and two points on CW: a total of two (three on CW) points for each error free contact. The same station can be contacted only once on each band and mode for a valid point credit. Contacts with own country count also.

Multipliers: On each band a multiplier of one for each different DXCC country contacted, plus one for each call area in the following countries: Australia VK1-8; Brazil PY1-8; Canada VE1-8, VO1, VO2, VY1; Japan JA1-0; European RSFSR — USSR UA1, 3, 4, 6; Asian RSFSR — USSR UA9, 0; USA W/K/N etc 0-9. (Do not count VK1 as a VK — country too). Also, a multiplier of one each for the land, maritime and aeronautical mobile group /M, /MM. /AM. Stations, except mobiles, operating from another call area must sign their call with a slash and a number of the area; eg K4VX/0, W0AIH/9, etc.

Scoring: The final score is the result of the total QSO points from all bands multiplied by the total multipliers from all bands.

Categories:

H. High Power — stations using the maximum legal limit up to 1000 watts output, (2000 watts PEP).

L. Low Power — stations using the maximum output power of 100 watts (200 watts PEP).

Q. QRP — stations using the maximum output of five watts (10 watts PEP).

In each of the above power groups there are the following categories:

A. Single Operator — All Band.
B. Single Operator — Single Bands: 160, 80, 40, 20, 15, 10 metres.
C. Multi Operator — Single Transmitter.
D. Multi Operator — Multi Transmitter.
E. Club Competition — Combined.

Combined Phone and CW scores will be used for the main competition category. Phone and CW results will also be listed and awards issued.

Category A and B can be operated by a single operator, without any other assistance from other operators, repeater nets or bulletin boards.

Category C and D includes club stations, stations operated by more than one operator and single operator stations using repeater, spotting nets or any other assistance when operating.

Single transmitter category stations may use only one transmitter which is connected to the power source during the contest. In case of failure, it may be replaced by another transmitter. Spotting operators may use receivers or transceivers with transmitter disabled only.

The multi transmitter category stations may operate one transmitter per band simultaneously. All transmitters must be located within a 500 metre diameter or within the property limits of the station licensees address. The antennas must be physically connected by wires to the transmitter.

Category E — Club competition entries may claim a maximum of one station per category, in a selected power group, on each mode (maximum 18 — nine on phone and nine on CW). The final club score is the addition of individual highest scores made by the club members on both modes. Expeditioners and mobile operations by the club members can also be counted. The club official must submit a list of stations, their category and scores. Each power group will be judged separately.

Awards: there will be awards of certificates, trophies and plaques.

Log Instructions: All dates/times must be in UTC. All the sent and received exchanges must be logged. A multiplier should be indicated only the first time it is worked on each band. Logs must be checked for duplicate contacts, correct QSO points and multipliers. Do not use separate sheets for each band, except for multi operator, multi transmitter stations who should keep separate logs and numbering per band. Single operator stations must clearly mark the rest periods in the log and should indicate the total operating time on the summary sheet. A sample contest form kit is available from IRSA for a SAE and US$1 or 3 IRCs.

All participants are encouraged to send the log in regardless of their score. They are needed for checking purposes.

A one year subscription to *Radiosporting* magazine will be awarded to the 10 stations selected by a draw from the logs received.

Deadline: Logs must be mailed not later than 30 days after the contest and be in the hands of the IRSA WRC Contest Committee by December 31, 1986. Logs to: IRSA WRC Contest Chairman, W3FG, PO Box 7, Odenton, MD, 21113-0007, USA.

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Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

Ulrich DJ9KR, the DARC National Bandwacht (Intruder Watch) Co-ordinator, reports that the net of the "Ministry of Foreign Affairs," in Islamabad, has, as a result of complaints, QSYed from around 14.345 MHz to 14.385 MHz. They should no longer be a problem to amateurs active on the top end of 20 metres. I have no evidence of interference in VK from the net, but it is nice to know that intruder watchers around the world are keeping an eye on things.

INTERFERENCE BECOMING RIFE

Moving a little south-east, a letter from Bernd DL7MV, of Bandung, Indonesia, gives us the following:

Bernd is the ITU senior training expert, RF Monitoring Branch, in his area, and tells me that he is interested in trying to help the Intruder Watch with the problem of the alleged Indonesian interference which is becoming rife on 28 MHz. I hope to be able to tell you more on this later.

HELPERS FOR THE MONTH

More good help in June 1986, from VK2s DVW, PS, OL, Mr G H A Bradford, VK3s AMD, CGG, VK4s AKX, BG, BHJ, BN, BTW, DA, KHZ, VK5s BJF, GZ, VK6s JQ, OD, RO, XV, VK7RH, VK8s HA and JF.

There were 278 cases of broadcasting interference reported, 141 in the CW mode, 69 RTTY pests, 38 other modes and 38 stations identified. The VI prefix is authorised for use in South Australia until December 31, so don't suspect piracy if you hear someone using this prefix.

OH! SO ENVIOUS

Often, as I write this column, I think of and envy those who write DX news columns — while they, on one hand, can pass on the good news of who are about on the bands for the chasing, I have, unfortunately, only news to pass on of those who ***shouldn't*** be on the bands. One of these days I will indulge in a fantasy, and report that "no intruders were heard for the previous month! ! !

USSR SHIPPING

Some interesting information to hand, courtesy of Colin VK2PLV who saw it in *Popular Communications*, October 1984. The article was written by Harry Caul KIL9XL, and deals with signals to and from USSR shipping.

Harry says, "Vessels belonging to the Soviet Merchant Marine, have radio call signs which are generally four-letter types, commencing at the letter **U** or some other prefix assigned to the USSR. Typical examples would include:

"ESXC (cargo vessel Magnit); UQIR (freighter Labinski; and ERUQ (freighter Gueograf). These call signs are shown in international merchant marine communications registries for commercial purposes. The radio call signs of fleet vessels of the Soviet Navy, of course, would not appear in the registries" . . . and . . . "for CW operations, vessels communicating with the **U** prefixed shore stations will most likely be using frequencies within the same band as the shore station, first establishing contact on a calling frequency and then switching to a mutually agreed-upon working channel." An extensive list of call signs accompanies the article and the infamous "UMS" appears, being listed as operating from Moscow.

So we learn a little more each day. As I close the column for this month, I point out that by far the greatest number of intrusions into our bands are by stations whose call signs begin with the letter "U"! Hmmm. See you next month, and take care.

ar

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED RECENTLY

DXCC PHONE
347 Bill Garvey VK2CWG

WAVKCA
1489 Club Station, Novorossisk UK6AAJ
1490 Victor H Apukhtin UW1CX
1491 Valery Matoushin UA9NN
1492 Paul Chipenko UA0LCM
1493 W W Kostjuk UB5MDL
1494 Mikhael Kamendrovsky UA1AWO
1495 George Alferyev UB5WJ
1496 Alex Zelenin UA3QJK
1497 Alex Ertskin UA0ABK
1498 Vladimir A Korolev UA0OO
1499 O E Novichkov UA9YDX

HAVKCA
116 Igor Tolmachev UA1 169 898
117 Alex Tkachenko UA3 147 122
118 Alexandr Maslow UJ8 040 207
119 S E Stepanov UA9 130 272

WIA 75 AWARD

Following is an update to recipients of the WIA 75 Award.
Cert No — 666 Eduard Anwar YC3CPJ
Cert No — 667 George R McKercher W0MLY
Cert No — 668 Donny Sirait YC6LD
Cert No — 669 Andrew Woolf VK2EPO
Cert No — 670 Soemardiono Isnaeni (Isna) YC3JVW
Cert No — 671 Herman Chosim YC3BR
Cert No — 672 Bambang Sutiyono YC2BLR

MARION CENTENARY AWARD

Further to the Marion Centenary Award which was announced in last month's column, the extremely attractive Award Certificates have been printed.

Each Award will be despatched in a sturdy mailing tube to ensure safe delivery.

See page 44, September AR for full details for claiming the Award.

INTERNATIONAL RADIOSPORT ASSOCIATION

The International Radiosport Association is an independent international organisation dedicated to the promotion of quality and sportsmanship in amateur radio. Its purposes and objectives are:

To promote international friendship and goodwill through sportsmanship, radio contesting and DXing.
To improve the quality of amateur radio operators and operating through education and experience, by voicing the opinions of radio amateurs that are experienced and have contributed to the hobby.
To promote amateur radio contesting and other operating-related activities as a sport, and to provide the publicity and recognition that it deserves in the public media.
To publish timely articles in the monthly magazine *Radiosporting*, to feature technical articles on equipment design and modification, antenna construction, radio-wave propagation, and commercial equipment reviews by qualified people.
To organise, as an annual event, the *International Contest Symposium*, which runs parallel (evenings) with the Dayton Hamvention; to feature timely topics with the participation of some of the world's leading amateurs at the symposium.
To hold an annual Awards Dinner with an entertainment program, where awards for various achievements are presented.
To maintain and publish all time record tables for significant contests
To sponsor and run an annual World Radio Championship Contest and World Contest Championship, based on results of a number of major contests, with the annual *Contester of the Year* awards in various categories.
To administer the *Contest Hall of Fame* and vote on awarding membership to those who have significantly contributed to the sport of contesting.
To co-ordinate and assist in the scheduling of international contests.
To hold regular weekly meetings on air, 14.200 and 3.380 MHz.
To provide an automatic, computer controlled bulletin station that transmits the latest DX and Contest news on CW and RTTY, 14.098 MHz.
All in all, the IRSA is dedicated to the pursuit of excellence and quality in amateur radio by promoting, publicising and leading the way.
Attractive numbered membership certificates and badges are issued to members.
IRSA is run by contesters who are selected for their accomplishments and it is independent of any national or commercial organisation.
IRSA will assist and sponsor Contest/DXpeditions, Trophies and other radio sporting and publicity events.
IRSA is a non-profit organisation, with all proceeds to be used to finance events and awards sponsored by IRSA and to cover expenses incurred by the Association.
IRSA members can display the IRSA logo on their QSL cards and correspondence; members agree to obey the Contester's Code of Ethics and to promote it.

The initial fee to join the IRSA id US$9; it includes the cost of a certificate and a badge. The yearly membership dues are US$4. (Or 22 and 10 IRCs respectively).

Honorary Life Membership will be awarded to those who significantly contribute to IRSA and the sport of contesting.

Members are entitled to be elected and to elect officers of IRSA. They will also enjoy many services and privileges offered exclusively to members.

IRSA Board of Directors
Yuri VE3BMV, George VE3MRN, Terry N6CW, Frank 9Y4VU, Sam ZS6BRZ, Dave Goodwin-Hill, Gyuri HA5JI, VE2ZP, Jiri OK2RZ, Tack JE1CKA, Bob VE3KZ, Karol VK2BQQ, Larry N7DD, Jim VE3IY, Martin VE3MR and Mike VE3JTQ.

DX Century Award
GENERAL RULES
The DXCA program is sponsored by the IRSA and *Radiosporting* magazine for all licensed radio amateurs and shortwave listeners all over the world.

All contacts must be made from the same country. Maritime, aeronautical and land mobile stations may operate from anywhere in the world.

Only contacts made after January 1, 1986 are valid for the basic award.

Awards for club stations will be issued to the club and not to an individual operator.

All amateur bands for which an applicant holds a valid license may be used, ***including*** new WARC bands.

QSL cards for the awards must be in the possession of the applicant. The application for the award must be certified by two licensed amateurs with a statement that the list of contacts and QSL cards agree. Any altering or forging will result in disqualification. The IRSA Awards Committee has the right to request the QSL cards for verification.

The ARRL DXCC countries list criteria will be used in determining what constitutes a "country." A particular operation or DXpedition does not have to be recognised by the ARRL in order to count for DXCA; ie Burma. As long as there is a reasonable proof that the operation took place as claimed, it will be recognised. If it is found in the future that certain operations were not legitimate, the credit for that operation will be removed from all applications claiming the operation in question.

All officially allowed modes of communication may be used: CW, SSB, AM, FM, Packet, RTTY, SSTV and Mixed-mode. Also separate categories will be recognised for satellite contacts, QRP, QRPp and mobile stations. All contacts must be two-way, using the same mode, except for the mixed mode. A valid contact must consist of a call sign and signal report exchange.

All claimed contacts must be made by the operators themselves, without the help of a third party; ie list or net operation. Non-interference with commercial services on shared bands, fair play and good sportsmanship are required of all DXCA holders and applicants. In the event of specific objections relative to continued poor operating ethics, an individual may be disqualified from the DXCA by action of the DXCA Awards Committee.

The application must contain a station's call sign, name and address, type of award applied for and list of contacts. The list of contacts and any

QSL cards in possession must include: call sign, signal report received, band, date, time in UTC, and two-way mode.

Call signs of all certificate holders will be published in *Radiosporting* magazine and a DXCA Honour Roll will be published twice a year.

The first 20 winners of monoband and multi-band awards will receive a free one year subscription to *Radiosporting* magazine.

The decision of the IRSA Awards Committee will be final.

All applications to be sent to IRSA — DXCA, Box 282, Pine Brook, NJ, 07058, USA.

SINGLE BAND DXCA

Single band DXCA Century Award is issued for working or hearing a minimum of 100 countries on one band. Endorsement stickers are issued in increments of 20 countries up to 240, increments of 10 up to 300 and increments of 5 above 300 countries.

Contacts made on all amateur bands (1.8, 3.5, 7, 10, 14, 18, 21, 24, 28 MHz and all VHF/UHF bands), as permitted by the license in the country of the applicant, are eligible for the award. All contacts must be made on one band. No cross-band contacts are allowed.

The basic award will be issued for a minimum of 100 countries confirmed on one band. A numbered endorsement sticker will be issued for each mode (CW, AM, SSB, FM, RTTY, Packet, SSTV and Mixed) and category (satellite, QRP, QRPp and mobile stations).

The holders of Single Band DXCA are allowed to use the abbreviation signifying the type of award and country total on their QSL cards.

Examples: 1.8 DXCA or 1.8 CW DXCA 124/265 which means Monoband: 1.8 MHz all CW mode, DXCA, 124 countries confirmed since January 1, 1986/number of countries worked.

MULTI BAND DXCA

6B DXCA, 7B DXCA, etc awards will be issued for confirmations from a minimum of 100 countries on each of at least six bands. A separate award will be issued for working 100 countries on 7, 8, or more bands.

Also, a cumulative total will be kept for an overall countries count similar to the monoband award: ie 7B DXCA (856/1265), which signifies that station has confirmed a minimum of 100 countries on each of seven bands and the total count is 856 countries since January 1, 1986 and 1265 countries on seven bands worked. A numbered sticker will be issued for each mode and category.

Stations having monoband DXCA need not submit the list of contacts already credited for monoband awards. It is sufficient to mention the certificate type and number, and only an additional list of contacts has to be submitted.

Stickers for increments of 100 countries will be issued from 600 to 2000, increments of 50, from 2000 and up.

The Honour Roll — listing of top contenders and latest changes in standings will be published in *Radiosporting* magazine twice a year.

The fee for each award is US$5 or 10 IRCs and each endorsement sticker is US$2 or 4 IRCs. Engraved Honour Roll Plaques will cost US$25.

A set of application forms and countries list for DXCA awards are available from IRSA for an SAE and 3 IRCs.

THE PADDLE STEAMER *INDUSTRY* JUBILEE 150 AWARD

Further to the announcement of this award in last months Awards Column, an illustration of the award is presented this month.

The award is signed by the Mayor of Renmark, Mr Lionel Sims. It is a three coloured award depicting the paddle steamer *Industry*, grouped with grapes and citrus fruit, local produce of the Riverland. There is also a short history of the PS *Industry*.

—Contributed by Doug Tamblyn VK5PDT, Awards Manager

NIGERIAN AMATEUR RADIO SOCIETY 25TH ANNIVERSARY CELEBRATION SPECIAL AWARD 1961-1986

During 1986, the Nigerian Amateur Radio Society celebrates its Silver Jubilee. To commemorate the occasion and to encourage more contacts with 5N-land, also to show the amateur radio community and friends around the world what NARS has achieved in the last 25 years, the Society will issue the above special award to any licensed amateur/SWL who works/hears amateur radio stations in the Federal Republic of Nigeria during 1986 under the following conditions:

— For stations located outside Nigeria five points are necessary.

These points are established as follows:

— Contact with each 5N station — one point
— Contact with a NARS club station — two points
— All modes, all allocated amateur bands

Send a list of contacts or log extract showing details of contacts/SWL reports, witnessed by two licensed amateurs. Contacts between January 1 and December 31, 1986 are valid for this award.

Cost is US$5 for an air mail return.

Address applications to: the Awards Manager, PO Box 2873, Lagos, Nigeria or PO Box 27522, Concord, Cal 94520, USA.

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AMATEUR PROJECTIONISTS

Information is required from Commercial Theatre Projectionists who are also amateurs with a view to a comprehensive article for *Amateur Radio*.

Considerable interest has already been shown from replies to a Hamad placed in August's AR, but more is required.

All interested amateurs should contact VK3AH, QTHR.

FLYING THE FLAG

The flying of the Australian flag at radio displays has not gone unnoticed.

Sam VK2BVS, was recently presented with a Certificate of Appreciation by Sir Colin Hines, President of the Australian National Flag Association, at a special ceremony at ANZAC House, Sydney.

Amateur radio made 100 new friends that evening as Sir Colin's words were broadcast over the 147 MHz repeater, to the delight of the VIPs that attended the presentation.

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

*E*lectro-*M*agnetic-*C*ompatibility difficulties are as old as radio communication. When G Marconi (Radio Amateur No 1) first operated more than one transmitter, QRM (interference) resulted. It became necessary to invent the "tuned circuit" to restrict the transmitted frequency spectrum and to improve the receiver selectivity. Now, about 90 years later, we are still dealing with the same problem!

Transmitter frequencies or channels and power levels are laid down in "recommendations" at world radio conferences of the *International Telecommunications Union* (ITU). These are at least partially adopted by the various national governments. Amateur radio frequency bands are also subject to the same ITU resolutions, which are largely adopted by national government authorities like the *Department of Communications* (DOC) in Australia, the FCC in USA, the FTZ in West Germany, etc. These resolutions cover the basic responsibilities and rights of all telecommunication transmitting services.

We now have a continuously growing number of electric/electronic services, appliances and apparatus which are not supposed to radiate electro-magnetic energy and which are not meant to transmit on frequencies allotted to telecommunication services (like amateur radio, government services, radio, television, etc). If such radiation occurs, it can cause interference and should be illegal. Appropriate standards define in some countries the maximum permitted power level and testing method for these radiations. Only radio services which violate international regulations, are likely to cause interference (jamming stations, woodpecker). A legally operated transmitter is not likely to cause interference, as long as transmitter and receiver standards are matched. Preference must be given to services which involve public safety and government business. Little more can be done on the transmitter side of any telecommunication service. Transmitters will always need effective aerials and adequate towers or masts (whether these are liked or not) and the permitted power level to fulfill their intended function. If legally operated transmitters affect receivers, amplifiers, or electronic signal processors, it may be likened to rain leaking through the roof. Do you stop the rain, or do you fix up the bad roof?

There are two kinds of receivers:

1. Electronic Apparatus or Devices, which are not supposed to receive legal radiation from communication transmitters, which have not been designed to be radio receivers, but whose intended function may be adversely affected by acting as receivers due to bad design. (An example is a car cruise control affected by the transmitter of the car radio telephone).
2. Television, Broadcast, Video Recorders, Preamplifiers and Accessories which should have enough selectivity/immunity to receive only transmissions from television or broadcast transmitters for which they are intended. They should be acceptably immune to legal transmissions from other frequency channels for which they are not designed, so that legal transmissions cannot be blamed for affecting their operation. If affected, only the receiver design (lack of selectivity), or in some cases non-linear devices nearby, may be held responsible.

Only the establishment, adoption and policing of adequate immunity standards for receiving and amplifying equipment of all kinds can result in logical, technically correct, fair and just compatibility of transmitter and receiver services. There is a wide spread popular view, still held by some members of the legal profession, that the unwanted signal reception effect can simply be stopped by closing down the transmitter. "They try to stop the rain, instead of fixing the leaking roof!" Stating that according to Common Law the legal transmission causes a "Public Nuisance," is an outdated logic, technically wrong (as admitted by some manufacturers), unfair and unjust.

More and more governments and appliance manufacturers recognise that receiver designers/manufacturers can and should contribute to solving or avoiding the ever increasing number and variety of EMC problems. The required know-how and technology has been developed long ago and is available in all countries. Much of the ground-work has been done by the EMC Commission representatives of the Association of Electrical Engineers (VDE), the West German Standards Association (DIN), the electronic industry, the FTZ (DOC), the German Amateur Radio Club (DARC, about 50 000 members) during years of meetings and technical work.

The measuring methods and EMC standards became West German law in 1981. In September 1982, the Australian Minister for Communications stated (as the law in West Germany already required) that the new Communications Act would probably specify standards for transmitters and receivers, and make it an offence to supply, possess or import equipment which does not meet the standards. The US President and the Senate signed into law at the same time the authority for the FCC to develop effective EMC standards. Nothing else will be of practical value!

It is hoped that these communication laws will also cover the Amateur Radio Service, as in West Germany where the law "G-1239-A" dated June 2, 1980, as special law, pre-empts the common law. The latter could be used unfairly against radio amateurs. Every effort should be made to ensure that the public, and especially the legal profession, see EMC problems in a logical, technical and fair manner. Co-operation of all concerned can usually overcome or at least reduce the problem without court cases.

To make the public aware of the EMC problem and the legal EMC standards, and to protect customers who intend to purchase a broadcast set, television set or Hi-Fi amplifier, etc the FTZ made it compulsory to have a FTZ warning letter in each equipment carton. This warning states the degree of immunity or compatibility with other services this type of apparatus has been tested to, and which unwanted effects lower EMC grades may produce. The government undertook to educate the customer — obviously a beneficial step. This is also "free advertising" for well made products, and should be supported by fair-minded manufacturers.

The proportion of the population who are radio amateurs is a definite indication of the stage of technological development a nation has attained. Peace-time emergency services and especially the war-time contribution rendered by the self-taught and privately financed Amateur Radio Service shows the importance of this activity. The practical experience of radio amateurs, supplementing formal engineering training, is often of benefit to the electronic industry.

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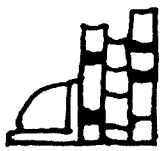
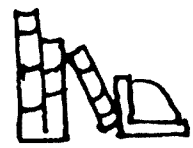


Book Review



Gil Sones VK3AUI
30 Moore Street, Box Hill South, Vic. 3128

QSP

THE ARRL ANTENNA COMPENDIUM — VOLUME 1
Published by the ARRL

The *Antenna Compendium* is not your complete antenna book. It is not intended to serve that function, but rather, it is a collection of material of interest to antenna experimenters. Much of this material has not been published previously.

Antennae from 160 metres to 10 GHz are covered in the Compendium with Quads, Log Periodics, Verticals and Dielectric Antennas some of the antennas covered. Even antennas which work below the ground are covered.

Treatment ranges from the highly practical aspects of making an antenna to mathematical analysis. However, don't be frightened by the mathematics — the practical details more than make up for the maths.

Material is backed-up by an extensive bibliography so that you can explore interesting topics further. There is even one item submitted by an Australian amateur.

Summing up the *Antenna Compendium* provides some interesting and thought provoking material. It is a book for the amateur who has an interest in aerials.

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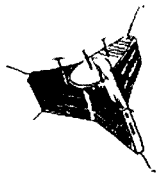
HEEL AND TOE GROUNDERS

Plastistat heel and toe grounders establish a ground path between mobile personnel and conductive flooring. In the absence of this grounding mechanism, electro-static voltages on moving people can reach levels as high as 12 000 to 35 000 volts. The grounders dissipate static to zero voltage in less than 0.1s in all levels of humidity.

The heel grounder is comprised of a conductive rubber heel cup, two Velcro straps and a conductive, fabric band. This design fits a variety of mens and womens shoes including boots, flat soles, safety shoes and joggers.

The toe grounder is comprised of a conductive toe strap attached to an elastic fabric band, and provides effective ESD for most types of footwear.

Abridged from *Electronic News*, p26 — April 1966



AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

OSCAR-10 APOGEES
OCTOBER 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEO	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st October										
274	2482	1121:49	-14	152	83	27	90	16		
274	2483	2301:20	-14	327					262	4
2nd October										
275	2484	1040:51	-14	142	89	19	95	8		
275	2485	2220:23	-14	318					267	12
3rd October										
276	2486	0959:54	-14	133	94	11	100	0		
276	2487	2139:25	-14	308			260	1	272	21
4th October										
277	2488	0918:56	-14	124	99	3				
277	2489	2058:28	-13	299	259	-1	266	9	277	29
5th October										
278	2491	2017:30	-13	290	264	6	271	17	283	38
6th October										
279	2493	1936:33	-13	280	269	14	277	25	291	46
7th October										
280	2495	1855:35	-13	271	274	22	283	33	301	54
8th October										
281	2497	1814:38	-13	262	280	30	291	41	316	61
9th October										
282	2499	1733:41	-13	252	287	39	300	49	337	66
10th October										
283	2501	1652:43	-13	243	296	47	313	56	4	67
11th October										
284	2503	1611:46	-13	233	307	54	331	61	30	65
12th October										
285	2505	1530:48	-13	224	323	60	353	64	48	59
13th October										
286	2507	1449:51	-13	215	345	64	17	63	61	51
14th October										
287	2509	1408:53	-12	205	9	65	37	59	70	43
15th October										
288	2511	1327:56	-12	196	32	61	52	52	77	34
16th October										
289	2513	1246:59	-12	187	48	55	63	45	83	26
17th October										
290	2515	1206:01	-12	177	61	48	72	37	88	17
18th October										
291	2517	1125:04	-12	168	70	40	79	29	93	9
19th October										
292	2519	1044:06	-12	158	77	32	85	21	98	1
292	2520	2223:38	-12	334					260	-2
20th October										
293	2521	1003:09	-12	149	83	24	90	13		
293	2522	2142:40	-12	324					265	6
21st October										
294	2523	0922:12	-12	140	88	15	95	5		
294	2524	2101:43	-12	315					270	14
22nd October										
295	2525	0841:14	-12	130	93					
295	2526	2020:45	-12	306			264	2	275	22
23rd October										
296	2527	0800:17	-12	121	98	-1				
296	2528	1939:45	-11	296	262	-0	269	10	281	30
24th October										
297	2530	1858:48	-11	287	267	7	274	18	288	39
25th October										
298	2532	1817:51	-11	278	272	15	280	26	296	47
26th October										
299	2534	1736:53	-11	268	278	23	287	34	308	55
27th October										
300	2536	1655:56	-11	259	284	32	296	42	324	61
28th October										
301	2538	1614:58	-11	249	292	40	306	49	346	65
29th October										
302	2540	1534:01	-11	240	301	47	320	56	11	65
30th October										
303	2542	1453:03	-11	231	314	54	338	60	33	61
31st October										
304	2544	1412:06	-11	221	331	60	0	62	50	55

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685 MHz — Summer: 7.064 MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305 MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGMENTS

Contributions this month are courtesy Bob VK3ZBB, Graham VK5AGR, and *AMSAT-Telemail*.

OSCAR-10 STATUS

As reported in last months column, OSCAR had been affected by radiation exposure and had suffered operational difficulties. Through the diligent work of Karl DJ4ZC, in rewriting the OSCAR-10 software, a new operating system, IPS-C4, was uploaded to the spacecraft to return it to an operational condition.

At the time of preparation of this column the onboard computers memory has had another cosmic "hit" and the inoperational condition is with us again. it is hoped that by the time you are reading this, the spacecraft will once again be operational.

SUCCESSFUL LAUNCH OF OSCAR-12/ JAS-1

The Japanese Amateur Satellite, JAS-1, was successfully launched on August 12, 1986 at 2045 hours. In recent months, this column has carried the general specifications of the spacecraft.

This month, we have the technical descriptions and appropriate formulae for the telemetry systems and the operational details for the Packet Radio experiment being carried on JAS-1.

WARNING! ! !

It is my understanding that JAS-1 has an overload detection system incorporated in the spacecraft's hardware and that when the spacecraft is totally released for general usage, the overload circuitry will automatically switch to an alternate mode, eg from Analogue Transponder Operation to Digital Transponder Operation, should excessively HIGH INPUT signals be detected in the passband. It is requested that uplink signals be limited to ensure that the downlink is no stronger than the beacon on 435.795 MHz.

Therefore, be warned, that should the transponder switch off — you may have been the irresponsible person who caused it! Just in case you think only the Americans and Europeans are the *alligators* within the OSCAR-10 passband just tune through the passband. The current Australian *alligators* on OSCAR-10 who migrate to OSCAR-12/JAS-1 are going to achieve significant notoriety when they shutdown the transponders. Enuff said! ! !

JAS-1 CE Telemetry Calibration Equations

Format of CW (at 20 WPM) telemetry on:

HI	HI		
1A	1B	1C	1D
2A	2B	2C	2D
3A	3B	3C	3D
4A	4B	4C	4D
5A	5B	5C	5D

Therefore, CW telemetry has 20 channels of data and each channel is made up of three digits. The numbers 1 to 5 shown above indicate channel numbers, and each letter (A, B, C, and D) stands for two digits.

Channels through 1A to 3D show analog data,

while the rest (4A to 5D) indicates status points to be described below.

The Analog Telemetry Data

The number in each channel represents a two digit *Decimal* number; ie in the range 00 to 99. example: 123 ---> number is 23 (decimal) ---> N = 23.

Ch. #	Parameter	Equation
1A	Total Solar Array Current	20.0 * (N + 4.0) mA
1B	Battery Charge/Discharge	40.0 * (N - 46.0) mA
1C	Battery Voltage	(N+4) * 0.22 V
1D	Half-Battery Voltage	(N+4) * 0.098 V
2A	Bus Voltage	(N+4) * 0.20 V
2B	+ 5 V Reg Voltage	(N+4) * 0.06 V
2C	JTA Power Output	2 * (N+4) ^1.618 mW
2D	Calibration Voltage #1	(N+4) / 50 V
3A	Battery Temp	1.50 * (62.0 - N) deg C
3B	Baseplate Temp #1	1.50 * (62.0 - N) deg C
3C	Baseplate Temp #2	1.50 * (62.0 - N) deg C
3D	Baseplate Temp #3	1.50 * (62.0 - N) deg C

OSCAR-10 APOGEES
NOVEMBER 1986

DAY #	ORBIT #	APOGEE U.T.C HMMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st November										
305	2546	1331:09	-11	212	352	62	22	60	61	47
2nd November										
306	2548	1250:11	-10	203	15	62	40	55	70	39
3rd November										
307	2550	1209:14	-10	193	35	58	53	49	77	31
4th November										
308	2552	1128:16	-10	184	50	52	64	41	83	22
5th November										
309	2554	1047:19	-10	174	61	44	72	33	88	14
6th November										
310	2556	1006:21	-10	165	70	36	78	25	93	6
7th November										
311	2558	0925:24	-10	156	77	28	84	17	98	-2
311	2559	2104:55	-10	331					263	-1
8th November										
312	2560	0844:27	-10	146	83	20	90	9		
312	2561	2023:58	-10	322					268	7
9th November										
313	2562	0803:29	-10	137	88	12	95	1		
313	2563	1943:00	-10	312					273	15
10th November										
314	2564	0722:32	-10	128	93	4				
314	2565	1902:03	-10	303			267	4	279	23
11th November										
315	2567	1821:06	-9	294	265	1	272	11	285	32
12th November										
316	2569	1740:08	-9	284	270	9	278	19	292	40
13th November										
317	2571	1659:11	-9	275	276	17	284	27	302	48
14th November										
318	2573	1618:13	-9	266	282	25	292	35	314	55
15th November										
319	2575	1537:16	-9	256	289	33	301	43	332	60
16th November										
320	2577	1456:16	-9	247	297	40	312	50	353	63
17th November										
321	2579	1415:18	-9	237	307	48	327	55	17	62
18th November										
322	2581	1334:21	-9	228	321	54	345	59	36	58
19th November										
323	2583	1253:24	-9	219	338	59	6	59	51	51
20th November										
324	2585	1212:26	-8	209	359	60	26	57	62	44
21st November										
325	2587	1131:29	-8	200	20	59	42	52	70	36
22nd November										
326	2589	1050:31	-8	191	37	54	54	45	77	27
23rd November										
327	2591	1009:34	-8	181	51	48	64	38	82	19
24th November										
328	2593	0928:37	-8	172	61	41	72	30	88	11
25th November										
329	2595	0847:39	-8	162	70	33	78	22	92	2
26th November										
330	2597	0806:42	-8	153	76	25	84	14		
330	2598	1946:13	-8	328					266	0
27th November										
331	2599	0725:44	-8	144	82	17	89	6		
331	2600	1905:16	-8	319					271	8
28th November										
332	2601	0644:47	-8	134	88	8	95	-2		
332	2602	1824:18	-8	310					277	16
29th November										
333	2603	0603:49	-7	125	93	1				
333	2604	1743:21	-7	300			270	5	283	24
30th November										
334	2606	1702:23	-7	291	268	2	276	12	289	33

Status Telemetry Data Format

The number in each channel represents two digit *Octal* number, whose range is between 00 and 37 (0 to 31 in decimal, 00 to 1F in hexadecimal).

Therefore, only five lower bits are valid as data. Each bit represents the various status shown in the following table.

note:
bit 0 is LSB (Least Significant Bit)
bit 4 is MSB (Most Significant Bit)
example: 432 --> 32 (Octal) = 11010 (Binary)

bit 0 (LSB)	0
bit 1	1
bit 2	0
bit 3	1
bit 4 (MSB)	1

Ch #	Bit	Item	1	0
4A	0	JTA Power	On	Off
4A	1	JTD Power	On	Off
4A	2	Eng Data #1		
4A	3	Eng Data #2		
4A	4	JTA Beacon	PSK	CW
4B	0	UVC Status	On	Off
4B	1	UVC Level	1	2
4B	2	Battery Status	Tric	Full
4B	3	Battery Logic	Tric	Full
4B	4	Main Relay	On	Off
4C	0	PCU Status	Bit 1 (LSB)	
4C	1	PCU Status	Bit 2 (MSB)	
4C	2	PCU Control	Manual	Auto
4C	3	Eng Data #3		
4C	4	Eng Data #4		
4D	0	Memory Unit #0	On	Off
4D	1	Memory Unit #1	On	Off
4D	2	Memory Unit #2	On	Off
4D	3	Memory Unit #3	On	Off
4D	4	Computer Power	On	Off
5A	0	Memory Select	Bit 1 (LSB)	
5A	1	Memory Select	Bit 2 (MSB)	
5A	2	Eng Data #5		
5A	3	Eng Data #6		
5A	4	Eng Data #7		
5B	0	Solar Panel #1	Lit	Dark
5B	1	Solar Panel #2	Lit	Dark
5B	2	Solar Panel #3	Lit	Dark
5B	3	Solar Panel #4	Lit	Dark
5B	4	Solar Panel #5	Lit	Dark
5C	0	CW Beacon Source	CPU	TLM
5C	1	Eng Data #8		
5C	2	Eng Data #9		
5C	3	Eng Data #10		
5C	4	Eng Data #11		
5D	0	Eng Data #12		
5D	1	Eng Data #13		
5D	2	Eng Data #14		
5D	3	Eng Data #15		
5D	4	Eng Data #16		

JAS-1 PSK Telemetry Calibration Equations

JAS-1 Telemetry Data Format

JAS-1 FF YY/MM/DD HH:MM:SS

xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx
xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx
xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx
sss sss sss sss sss sss sss sss sss sss

FF:= Frame Identifier

- RA: Realtime Telemetry — ASCII
- RB: Realtime Telemetry — Binary
- SA: Stored Telemetry — ASCII
- SB: Stored Telemetry — Binary
- M0:Message #0
- M1:Message #1
- .....
- M9:Message #9

YY/MM/DD = Date
HH:MM:SS = Time (UTC)

The following is valid only for RA and SA frames.

xxx = 000 - 999 — Format: 3 digit decimal (Analog Data) 27 samples in row 0 column 0 thru row 2 column 6 (denoted #00 - #26 below)

y = 0 - F — One Byte Hex (System Status Data) 9 samples in row 2 column 7 thru row 2 column 9 (denoted #27a - #29c below)

s = 0 or 1 — Binary Status Data 30 samples in row 3 thru row

3 column 9 (denoted #30a - #39c below)

JAS-1 Telemetry Calibration Equations

CH #	ITEM	EQUATION
00	Total Solar Array Current	1.91 * (N - 4) mA
01	Battery Charge/Discharge	3.81 * (N - 264) mA
02	Battery Voltage	N * 0.0210 V
03	Hall-Battery Voltage	N * 0.00937 V
04	Bus Voltage	N * 0.0192 V
05	+ 5 V Regulator Voltage	N * 0.00572 V
06	- 5 V Regulator Voltage	N * -0.00572 V
07	+10 V Regulator Voltage	N * 0.0116 V
08	JTA Power Output	5.1 * (N - 158) mW
09	JTD Power Output	5.4 * (N - 116) mW
10	Calibration Voltage #2	N / 500 V
11	Offset Voltage #1	N / 500 V
12	Battery Temperature	0.139 * (689 - N) Deg C
13	JTD Temperature	0.139 * (689 - N) Deg C
14	Baseplate Temperature #1	0.139 * (689 - N) Deg C
15	Baseplate Temperature #2	0.139 * (689 - N) Deg C
16	Baseplate Temperature #3	0.139 * (689 - N) Deg C
17	Baseplate Temperature #4	0.139 * (689 - N) Deg C
18	Temperature Calibration #1	N / 500 V
19	Offset Voltage #2	N / 500 V
20	Facet Temperature #1	0.38 * (N - 684) Deg C
21	Facet Temperature #2	0.38 * (N - 884) Deg C
22	Facet Temperature #3	0.38 * (N - 690) Deg C
23	Facet Temperature #4	0.38 * (N - 683) Deg C
24	Facet Temperature #5	0.38 * (N - 689) Deg C
25	Temperature Calibration #2	N / 500 V
26	Temperature Calibration #3	N / 500 V

JAS-1 System Status Telemetry Bytes

Ch # Item

27a Spare (TBD)
27b Spare (TBD)
27c Spare (TBD)

28a Spare (TBD)
28b Spare (TBD)
28c Memory Unit #0 error count

29a Memory Unit #1 error count
29b Memory Unit #2 error count
29c Memory Unit #3 error count

JAS-1 Binary Status Data Points

Ch #	Item	1	0
30a	JTA Power	On	Off
30b	JTD Power	On	Off
30c	JTA Beacon	PSK	CW
31a	UVC Status	On	Off
31b	UVC Level	1	2
31c	Main Relay	On	Off
32a	Engineering Data #1		
32b	Battery Status	Tric	Full
32c	Battery Logic	Tric	Full
33a	Engineering Data #2		
33b	PCU Status	Bit 1 (LSB)	
33c	PCU Status	Bit 2 (MSB)	
34a	Memory Unit #0	On	Off
34b	Memory Unit #1	On	Off
34c	Memory Unit #2	On	Off
35a	Memory Unit #3	On	Off
35b	Memory Select	Bit 1 (LSB)	
35c	Memory Select	Bit 2 (MSB)	
36a	Engineering Data #3		
36b	Engineering Data #4		
36c	Computer Power	On	Off
37a	Engineering Data #5		
37b	Solar Panel #1	Lit	Dark
37c	Solar Panel #2	Lit	Dark
38a	Solar Panel #3	Lit	Dark
38b	Solar Panel #4	Lit	Dark
38c	Solar Panel #5	Lit	Dark
39a	Engineering Data #6		
39b	CW Beacon Source	CPU	TLM
39c	Engineering Data #7		

Example:
JAS-1 RA 86/08/01 09:00:00
500 xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx xxx 000 004 yyy 01s sss sss sss sss sss sss sss sss sss
Real time ASCII frame sent on 86/08/01 at 09.00.00 UTC
Total Solar Array Current = 947 mA
Memory Unit #0 error count = 4
JTA power off
JTD power on

JAS-1 Packet BBS User Interface Information

Mailbox Commands (Basic users training)

1. Summary

1.1 Available commands

F: List files addressed to all or to current user
H: Help
K: Kill file/s
M: List file/s to/from current user
R: Read file/s
W: Write file

1.2 Command syntax

The general format is: <a command letter> <space> <argument>. At least one blank is required between <a command letter> and <argument>.

2. Command Prompt

JAS-1 Mailbox supplies a prompt "JAS>" with no CR or LF to indicate that the system is ready to accept a command from the user.
A user can "type ahead" commands while JAS-1 is sending messages or data to the user. JAS-1 will execute the commands in the waiting queue later.

3. Commands

3.1 The "F" Command

F = FILES. Shows the latest 10 files the first time it is entered during a session. Subsequent 'F' commands will list the next 10 active files (messages). A message posted to multiple users has "*" in its 'To:' destination field. See also the "M" command described below.
example:
JAS>F

NO	DATE	FROM	TO	SUBJECT
117	10/12	F6ZS	All	ARSENE update
116	10/12	DL3AH	All	Abgleichanleitung der AFREG
114	10/11	JA1RL	All	JAS-1 new schedule
113	10/11	WA2LQQ	All	ALINS for Phase-3C
112	10/10	JA1DSI	All	Who manages HK0XX QSL?
111	10/10	G3AAJ	*	Harry in London
110	10/09	W0RPK	All	P-3C countdown #8
107	10/09	9M2CR	All	NMCR AMTOR mailbox now QRV
103	10/06	JR1FIG	JA9BOH	Uchiawase wa raishuu?
102	10/09	N7FDA	*	RS-232c card for PC-1089

JAS>F

101	10/09	G3RUH	All	New software for BBC
100	10/08	JR1ING	JR1FIG	Sara ni kogata no TNC
99	10/08	JA1TUR	All	AFDEM-JA #3 in progress
98	10/08	N5AHD	All	Call for papers
96	10/08	KA9Q	All	TCP/IP on TAPR NNC
95	10/08	N5AHD	JR1FIG	Automatic tracking system
94	10/07	DJ6KQ	All	IPS-RA enhancements
93	10/07	DB2OS	All	Wettersatelliten
92	10/07	DB2OS	All	RUDAK-Statusreport
85	10/07	5H3KK	All	Now QRV on JAS-1

3.2 R <file#1>, <file#2>, <file#3>, ..., <file#7>, <file#8>

R = READ/ Read file/s (messages) specified by file number/s you got from the 'F' command. Up to eight files can be specified.
example:
JAS>R 95,102

Posted: 86/10/08 17:33 UTC
From: N5AHD
To: JR1FIG
Subj: Automatic tracking system

Dear Saya,
Thank you for your compliments on the manual you received from G3AAJ. Two computers are now used — one for control of antenna system, radios, and so forth and another one is used for the actual data capture. The system now allows several satellites to be selected and data ports, tracking priorities, modulation mode, and other things to be associated with each. I have been working on a couple of articles describing the new system and would be glad to send you copies when I am finished.
73, Robert. J. Diersing, N5AHD

Posted: 86/10/09 03:21:42 UTC
From: N7FDA
To: JR1FIG, JA1JHF
Subj: RS-232c card for PC-1089

Saya,
I need one more RS-232c card for my old faithful PC-1089. Would you ask Kanawa san if he could still get one in Akihabara?
Miki

3.3 W (call1, call2, call3, ..., call7, call8)

W = Write. Send message (file) to others. As many as eight destination addresses can be specified. The part of the command line in brackets (call1, call2, call3 ...) is optional. A message without specific destination is "public", ie address to "All".

The JAS-1 mailbox will then prompt you to send the subject field by sending "Subj:". You can send a subject field with up to a 32 character string. After receiving the "Text:" prompt, you enter the message text, ending each line with <cr> (carriage return). You terminate with either a

<cr>.<cr>
or <cr> <ctl-Z> <cr>

(ie a line containing only a period or a control-Z) to indicate end of your text.

example:
JAS>W N7FDA
Subj: Roger, wait for a while.
Text:
Miki,
Roger, I'll immediately call him up and get an info for your "Main Frame".
I am going to put that info during next orbit.
Saya
^Z

3.4 K <file#1>, <file#2>, <file#3>, ... <file#7>, <file#8>

K = KILL! Delete file/s (messages) specified by file numbers. The <file#> is the same one described in R command. Up to eight files can be specified in a command line. A user can only delete files addressed solely to himself (ie not to multiple users) or files he posted.

3.5 H

H = HELP! Entering H <cmd> gives additional information on that command.
Entering only H will give a list of all available commands.

3.6 M

M = Mine. List the latest 10 files (messages) that are either to or from the current user. Additional M commands list additional active messages. This command will be useful to save channel time when the user only wants to see his messages.

JAS>M

NO	DATE	FROM	TO	SUBJECT
111	10/10	G3AAJ	*	Harry in London
103	10/06	JR1FIG	JA9BOH	Uchiawase wa raishuu?
102	10/09	N7FDA	*	RS-232c card for PC-1089
100	10/08	JR1ING	JR1FIG	Sara ni kogata no TNC
95	10/08	N5AHD	JR1FIG	Automatic tracking system

SATELLITE ACTIVITY FOR THE MONTH OF JUNE 1986

1. LAUNCHES

The following launching announcements have been received:

1986-042A (16758)	Cosmos 1748	June 06	USSR
1986-042B (16759)	Cosmos 1749	June 06	USSR
1986-042C (16760)	Cosmos 1750	June 06	USSR
1986-042D (16761)	Cosmos 1751	June 08	USSR
1986-042E (16762)	Cosmos 1752	June 06	USSR
1986-042F (16763)	Cosmos 1763	June 06	USSR
1986-042G (16764)	Cosmos 1754	June 06	USSR
1986-042H (16785)	Cosmos 1755	June 06	USSR
1986-043A (16767)	Cosmos 1756	June 06	USSR
1986-044A (16769)	Horizont 12	June 10	USSR
1986-045A (16772)	Cosmos 1757	June 11	USSR
1986-046A (16791)	Cosmos 1758	June 12	USSR
1986-047A (16798)	Cosmos 1759	June 18	USSR
1986-048A (16800)	Cosmos 1760	June 19	USSR
1986-049A (16802)	Molniya 3-29	June 19	USSR

2. RETURNS

During the month 39 objects decayed including the following satellites:

1986-028A	Cosmos 1739	June 07
1986-032A	Progress 26	June 23
1986-035A	Soyuz TM	May 30
1986-036A	Cosmos 1744	June 04
1986-040A	Cosmos 1746	June 12
1986-041A	Cosmos 1747	June 12
1986-045A	Cosmos 1757	June 25

JAS-1

HI HI from space . . .
Eight minutes late!

Wednesday, August 13, had amateur radio operators around the world listening anxiously for the first signs of life from the latest amateur radio satellite.

Amateurs have used the Morse code letters HI for decades to indicate laughter, probably because of the sound of the Morse letters: di di di dit di dit.

It was fitting, therefore that the satellite radio transmitter would first send this message back to earth.

Launched by the controlling body of amateur radio in Japan, the Japanese Amateur Relay League, JAS-1 Satellite was due to blast into space from the Tanega-shima Space Centre at 2031 UTC.

The satellite was carried as payload on the test launch of Japan's H-I launcher and, as such, did not attract the many millions of dollars fees commanded by other methods of launching.

Even so, the satellite itself had to be funded entirely by amateur operators.

With separation from the launch vehicle over Chile at one hour 10 minutes after launch, the first pass over Sydney should have been at 2248 hours UTC (08.48 am).

Licensed radio amateurs employed by Dick Smith Electronics head office in Sydney set up a special station using the DSE Amateur Radio Club's call sign, VK2DRS, to listen out for the telemetry signals from JAS-1, indicating all had gone well.

The JAS-1 satellite includes a beacon which continually transmits Morse data on approximately 435.795 MHz, in the 70 cm amateur band.

Operators at VK2DRS had some anxious moments as 2248 UTC came and went with no sign of signals from space.

Then, some eight minutes later, at 2256, came the sound of laughter everyone was waiting for: HI HI, followed by groups of numbers as the spacecraft transmitted data back to earth.

The laughter from space was echoed on the ground as the amateurs realised all was well.

Within a few days the spacecraft would be ready to act as a relay station in space, where amateurs from any country could call other stations around the world via transponders on the vehicle.

And within a month or two, JAS-1 will become the first "Packet" radio repeater, allowing fully automatic, unmanned communication between amateur radio stations having the necessary computer equipment.

The equipment used at VK2DRS/P was a Yaesu FT-726R All Mode VHF/UHF transceiver with 70 cm and satellite options and an RF Aerospace SAT7018GR 18 element 70 cm Yagi antenna. A Yaesu FR-7700 receiver was also used to monitor AMSAT's information service from the US on 20 metres.

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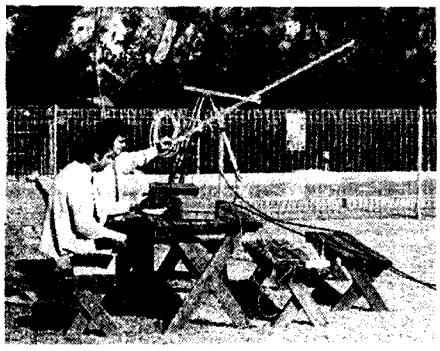
The club station VK2DRS/P listens for JAS-1 on the morning of August 13. Operators are Ross VK2KRT and Andrew VK2XKK.
—Photograph taken by Garry VK2YBX and presented courtesy Wendy Giles of *Dick Smith Electronic*

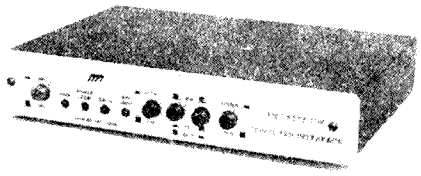


EASY RTTY/CW OPERATION

The MFJ-1224 Computer Interface, a small neat package which hooks-up between a radio receiver/transceiver and the users computer, is designed to make RTTY, CW ASCII and AMTOR operations a breeze.

It is supplied complete with CW and RTTY software to suit the VIC-20 and C- 64 computers, but its versatility allows it to be used with almost any personal computer providing it has the appropriate software. Additionally, the unit is fully AMTOR compatible when used with a computer equipped with AMTOR software.

The MFJ-1224 can copy on all the standard shifts — 170 Hz, 425 Hz, and 850 Hz plus other shifts between and beyond. When running the 170 Hz shift a sharp eight-pole active filter is automatically switched in which very effectively cleans the majority of noise off the incoming signal. It automatically copies CW speeds from five to 100 WPM and up to 300 Baud on RTTY.



A unique feature of the 1224's design allows it to copy on both mark and space tones, which greatly improves copy during adverse conditions. A built-in automatic noise limiter helps suppress static crashes and provides better copy whilst a Normal/Reverse switch eliminates retuning while stepping through various RTTY speeds and shifts.

Other features also include a +250 volts DC output to directly drive a RTTY machine, a speaker output and an easy to use two LED tuning indicator system.

For further information please contact the Australian Distributor, GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

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RECEIVE SIGNALS FROM AROUND THE WORLD ON A SCANNER

With the addition of a small $99 box, your programmable scanner can now listen to signals from the other side of the globe.

Manufactured by GFS Electronic Imports, the new *Worldscan* shortwave and broadcast converter for programmable scanning receivers (complete with a supplied three metre wire antenna), can add hours of listening pleasure to your scanning operations.

The *Worldscan* is smaller than a cigarette packet, runs from its own in-built nine volt battery and simply plugs into the antenna socket of the scanner. The host scanner can then cover an additional frequency range from 300 kHz to 25 MHz. This makes it possible to listen to local AM broadcast stations as well as hundreds of overseas AM broadcasters who use the shortwave bands. These stations include the Voice of America and the BBC.

The *Worldscan's* output frequency range is from 120.300 to 145.000 MHz so that, for example, a 7.500 MHz shortwave signal would be found on 127.500 MHz.

For further information please contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

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A CONNECTOR THAT ABLY ACCOMMODATES BIG AMP OUTPUTS

A new audio connector system from Utilux has set an industry standard by providing a solution to the problems of amplifier-speaker connection that have been growing since the 60s with the growth in loudspeaker wattage.

The Utilux UX series of high power audio connectors has the ability to reliably transmit signals with a dynamic range from micro-volts to a hefty 30 amperes.

Since the 60s when audio amplifiers were considered "low level signal" — around 20 watts — audio amplifier output powers have been gradually increasing to today's high levels, commonly exceeding 1000 watts and often reaching 3600 watts.

Over the years, amplifier output connectors have remained largely unchanged. Increasingly powerful and sophisticated equipment has continued to bear the inadequacies of banana plugs and phone jacks developed in the 'low signal 60s.' This has meant not only signal impedance, but electrical safety standards were often dangerously compromised by very high amperage.

The UX series provides high current, large cable (8 x 14 mm) capacity with no risk of shortage or of electrocution. Terminated to 10 AWG cable, connector temperature does not rise above cable temperature even with 30 ampere continuous load.

The system comprises two parts — a cable end connector — UX100 — and a panel mount connector — UX500. To accommodate existing standards, the UX500 has the same cutout profile as an XLR type female socket. Two UX100 connectors can be mated for cable-to-cable connection, or one UX100 can be mated with one UX500 for cable-to-equipment connection.

A genderless format cleverly defies *Murphy's Law* in either connection by ensuring correct polarisation and the impossibility of a mismatch.

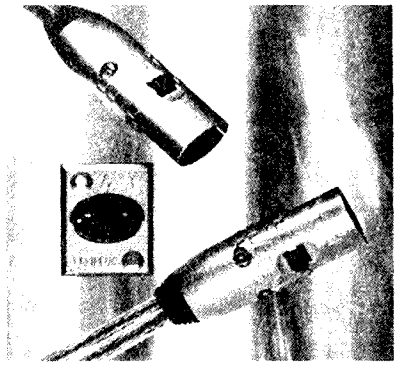
Amplifier to speaker connections in the UX system are positively identified by a distinctive oval shape measuring 17 x 24 mm.

The UX system can be easily assembled using a soldering iron and screwdriver. Contacts are supplied separately, soldered to the cable by the user, and then snapped into the connector body. This facilitates equipment assembly and avoids melting the insulator when soldering to heavy cable.

Fully assembled, the connectors provide the highest level of safety with total insulation between contacts and the metal shell.

The connector contacts are formed from a copper-iron alloy and silver- plated (or gold-plated to special order) with a total contact area of 30 mm squared and solder cup for up to 3 mm diameter conductors. As specified in IEC safety standards, the contacts cannot be shorted during connections and are finger inaccessible to prevent electric shock.

Inherent in the connector system is also a superior robustness, combining rugged die-cast



alloy construction with positively latch locking and a super-strength stainless-steel bar cable clamp. Both flat and round cable can be secured to withstand up to 30 Newton pull out force.

Offering audio professionals a connection system of the same high calibre as their amplifiers and loudspeakers, the Utilux UX series provides not only a long sought quality but an opportunity to finally standardise this area of common practice.

For further information please contact Utilux Pty Ltd, 14 Commercial Road, Kingsgrove, NSW. 2208.

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QSP

LASERS TO ETCH MICROCHIPS

In the traditional process for manufacturing ICs, as many as 100 individual steps may be required. Each step increases the risk that the finished product will contain some flaw that renders the chips unusable. Depending on the size and complexity of the chip, less than half of the finished wafer may yield acceptable chips, leaving the surviving chips to recover the entire cost of fabrication.

Not surprisingly, IC manufacturers are constantly seeking ways to improve yield and reduce costs. In one new technique, a laser used as a photo- etching device scans the surface of a silicon wafer in the presence of certain gases. Under static conditions, these gases have no effect on silicon; the energy of the laser, however, decomposes the gases into compounds that define active elements and interconnects by either etching away unwanted material or by deposition onto the substrate. The source and drain regions of a transistor are made by doping the silicon with phosphorus, which the laser creates by breaking molecules of phosphine gas. Hydrogen chloride, which serves as an etchant, is activated by the thermal energy of the laser beam. Interconnects on the chip are made by similarly decomposing gases that contain tungsten, nickel, and polysilicon.

One of the major incentives for this new method is a national program, led largely by the Departments of Defences and Energy, to develop new classes of super-computers. Much of this work has been done at the Lawrence Livermore National Laboratory, where experiments indicate that the technique can produce as many as 1000 transistors per second. At this rate, it would be possible to fabricate super-computer chips — consisting of about 100 000 transistors each — at the rate of one per day.

Other exciting possibilities include repairing damaged high-value chips and turning a new design into a prototype chip in one day or less, as opposed to today's turnaround time of one to four weeks.

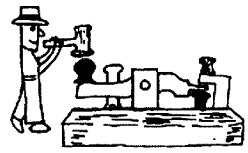
—Reprinted from *ham radio*, July 1986

WAFERSCALE INTEGRATION

This technique uses the surface of a silicon wafer to implement an entire functional capacity. Examples include complete 32-bit microprocessors, with memory and all relevant I/O functions, a "silicon" hard disk with 20 MB of storage, RAM speed, and all disk controller functions on a single wafer.

WaferScale integration promises to make very complex functions available in a single package. But this improvement is not without peril. Because of the large amount of circuitry and the extensive processing required on such devices, any mistake in fabrication results in a very expensive piece of scrap. Also, the large number of circuits and functions possible with WSI makes packaging considerations a major concern; it may be necessary to have hundreds of pins on a very complex functional element — more than can now be accommodated. However, the general benefits of WSI seem to justify the complexities of making such devices, and within the next few months the first few WSI products are expected to be announced.

—Reprinted from *ham radio* July 1986



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

Hello again, and welcome to October (he says cheekily, writing in early August!). Well, first of all, a reminder that the National Sprints are only a month away, with the CW Sprint taking place on Saturday, November 15. The full rules should be in the Contests Column this month, and I am sure you will agree that everything possible has been done to Keep It Simple. Please think seriously about having a bash at it, even if you are not a "contester." It will not take a lot of time, it should be good fun, and certainly provide a bit of a challenge.

Just a bit of food for thought . . . in drafting the rules I asked for, and got, the much appreciated assistance of Ian VK5QX, who is the Federal Contest Manager. There was only one point we disagreed on, and in the finish we "agreed to disagree." That is the format of the serial number required for each exchange. You will note that the rules say that the serial number must be a three digit number but can start with any number. Ian feels very strongly that serial numbers should start with 001 in all cases.

My reasons for preferring a start at any number are threefold. First, a zero takes a *long* time to send in Morse. Not all operators, and specifically not all of the slower ones, use the letter "T" to represent zero, so a start at, say 500, can save a bit of time where zeros are sent. Second, (and I admit this has limited relevance, but it includes yours truly) some keyers have a facility for generating contest numbers, but the first digit cannot be a zero. Third, and most important, if everyone starts at 001 it is easy to see where one stands in the contest at any given time. Ian thinks this is a good thing, but Ian is a very competitive contester. I think it tends to discourage late starters and slower operators. If you do not know where you stand you may continue longer than if you know you don't have a hope of catching up. Anyway, there it is, and we will see how a reversion to free numbering works in the Sprints.

Now I promised to write about the Adelaide Hills Amateur Radio Society's visit to the OTC Coast Radio Station (Adelaide Radio) at McLaren Vale. For the benefit of the club members who were unable to visit the facility, the manager, Fred Reeve VK5YK, attended the Society's last meeting and spoke on the subject of the services provided by the CRS. It was a most enjoyable and informative talk, and if all CRS managers are of Fred's calibre, it would be well worth any club secretary contacting the nearest one.

First, the significance of all this in relation to this column, which, after all, is about CW operation and not commercial communications. From that point of view, you will be interested and perhaps as surprised as I was to learn that 85 percent of the traffic load at Adelaide Radio is CW or MCW! (MCW is modulated CW, where Morse code is sent using a modulated carrier so that equipment without BFOs; eg AM-only, can receive it). This says two things to me — first, CW is far from dead in the maritime communications field, and second, the CRS constitutes one of the few remaining professional Morse operations in the world. With the dependence on CW and the necessity of handling unscheduled operations with a variety of stations, it is more like amateur radio than any other communication field.

As you are probably aware, the primary role of the Overseas Telecommunications Commission is the operation of commercial communications services (telegrams, telephone, telex, facsimile) between Australia and other countries. It operates in parallel with *Telecom Australia* which has the responsibility for domestic communications. It follows that commercial traffic is the primary role of the Coast Radio Stations, but you will be pleased to know that all of the operators and staff regard Maritime Safety as their primary mission, and commercial traffic as secondary.

Adelaide Radio has two operators on duty during the day, and one at night, and all emergency channels are monitored. The area of responsibility extends from the mid-point between Melbourne and Adelaide to half-way across the Great Australian Bight, and there is some overlap with neighbouring CRS stations, 15 of which effectively ring Australia and provide 24-hour communications with ships at sea. Thus the CRS is usually the first to hear of any maritime emergency, and liaises closely with local Coastguards, Police, and the national search and rescue centre in Canberra.

In its commercial role, a CRS station can connect any ship at sea within its area of coverage with any person who can be reached by telephone, telegraph, or telex anywhere in the world.

The equipment necessary for Adelaide Radio's mission would bring tears to any amateur's eyes. Given top-line receivers for MF, HF, and VHF, the transmitting power available to the single nighttime operator is pretty impressive. There is a 2 kW transmitter on MF, and three 1 kW, fully synthesised transmitters on HF.

Maybe that does not sound like a lot of power (after all, 3 kW linears on the amateur bands are available overseas) but when you put a kilowatt into a CRS antenna it definitely gets radiated. The Adelaide Radio antenna farm covers 66 acres. It is a lot of real estate. There is wire everywhere, strung from seven 70 foot (20 metre) towers, and in the middle of it all is a 150 foot (46 metre) insulated, top-loaded tower which is itself the MF vertical radiator.

The other antennas comprise fans, folded dipoles, and cage quads. There is a copper earth mat 12 inches (30 cm) below the surface of the entire area, and you can imagine the amusement of the staff at the station when a state electrical authority inspector complained that the 240 volt service was "inadequately earthed." And to top it all off, there are legal constraints against anyone building anything in the vicinity of the station, which is in farmland separated by hills from Adelaide, so there are no problems with RFI.

In case the 240 volts supply fails a diesel generator can supply adequate power for sustained operation at full power. It is the size of a small car, and if it were a little more portable, I think it would go well in the John Moyle!

The 600 ohm transmission lines run from the station to separate receiver and transmitter gantries, where baluns match them to 70 ohm coaxial cable for the rest of the distance (.8 km in the case of the receiving antennas).

All in all, Adelaide Radio is admirably located and equipped to fulfill its mission. The only negative aspects were from the operator's standpoint, with fairly "antique" consoles, and the very common problem of having to upgrade technologies to support computers, satellites and so on. But the main thing is that they are there; they make some traffic money for OTC, but far more importantly, they provide a lifeline for all the ships at sea.

CU next month.

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Club Corner

GIPPSLAND GATE RADIO AND ELECTRONICS CLUB

The Gippsland Gate Radio Club has been the focal point of amateur radio activity in and around Dandenong, Victoria, for the past decade. In June 1986, there were some changes made within the Club and it is now known as the Gippsland Gate Radio and Electronics Club.

The original aims of promoting amateur radio communications are still maintained, but they now include the fields of Digital Electronics, Kit Building and Computers.

The GGREC is a group of electronic enthusiasts and radio amateur operators who promote all aspects of computers, hobby electronics and telecommunications. The Club features its own amateur radio station, a test equipment library and component sales to its members.

Monthly meetings are open to all ages and visitors are made most welcome. Meetings are held at 8 pm on the third Friday of each month at the 1st Oakwood Park Scout Hall, in Heyington Crescent, Dandenong.

Inquiries about the Club may be made to GGREC, PO Box 98, Dandenong, Vic. 3175.

—Contributed by Ian Johnson VK3BUF

DEVIL NEWS from the North-West

There were 23 members and three visitors in attendance at the last meeting. Apologies were received from VK7s SE, OL, SF and Athol Gill.

Letters of thanks were read from the Boys Brigade, Apex and the Horse Trials at Ulverstone, for the communications help given to them by the Club.

Several items were tabled for discussion, one of them being Camp Quality. After much discussion it was decided to use the club call sign VK7NW, for the camp station. Operations from Camp Quality will be from a caravan.

The QSL Bureau had another quiet month with very few cards being processed.

The committee have started thinking about the Hamfest which will be held on the North-West Coast.

A WICEN exercise will be held next year in conjunction with an air pageant at Wynyard. This has the makings of a very interesting exercise.

A warm welcome is extended to Malcom Prisstley, whose membership application was accepted at the meeting.

The meeting concluded with a successful auction of radio discards. Everyone managed to purchase something they *did not* want, thanks to a good auctioneer!

The RAD repeater will shortly be installed on top of Mount Duncan. A working party has already made the arduous climb to install the housing for it on August 10. The party consisted of VK7s ZAP, ZHA, AX, WP, WN, OM, ZBT, and WJ, with Andrew VK7ZAP, in charge.

They assembled at the Penguin High School at around 9.45 am and proceeded to the walking track in four wheel drives and a utility. A variety of materials were then transported to the peak via the backs or hands of the party. Ross VK7WP and Noel VK7NW carried the large and bulky steel housing for most of the trek.

Approximately two and a half hours were spent working on and inspecting the equipment already at the site.

The hardy adventurers had an eventful trip back down the mountain due to two trekkers taking a wrong path halfway down and proceeding for some distance before realising their error. At the base another two headed in the wrong direction in a four wheel drive but were able to find their way eventually.

—Notes compiled by Max Hardstaff VK7KY and Greg Stammers VK7ZBT

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WAGGA CONVENTION

As mentioned last month, the Wagga Wagga Convention is to be held over the weekend, October 25 and 26, 1986. It is expected to be an interesting and rewarding weekend for all who attend.

The program commences early on Saturday with displays, fox and hidden transmitter hunts, vintage equipment for sale, steam engines and trade displays. There will be attractions to interest amateurs, SWLs, hobbyists and family members. Several of the leading equipment suppliers have booked stands and shall be displaying the most modern equipment available today

Demonstrations of Packet Radio, Satellite TVRO, AUSSAT, ATV, and RTTY have been arranged and it is hoped to have people in attendance who will be able to give information and answer questions on the various aspects of each display.

The Conference Dinner will be held on Saturday evening. This year, the guest speaker for the evening will be Roger Harrison VK2ZTB. A private room has been reserved at a local club for the dinner, cost is $14 per head. Bookings are required early to ensure a vacancy. Bookings close on the Wednesday prior to the convention. Cheques should be forwarded to PO Box 294, Wagga Wagga, NSW. 2650. Late bookings or inquiries to Kevin Cox VK2ZKV, (069) 26 1284 or Peter Clee VK2KZZ, (069) 26 1532.

Events and activities will continue on the Sunday with prize giving and closure timed early to allow for those who have to travel long distances on the homeward journey.

Accommodation, on site, is available in bunks, or tent and caravan sites. This is available free of charge but reservation will be on a first come basis and payment of the registration fee. A limited number of bunks and sites are available.

Accommodation is also available in many of the numerous motels in Wagga Wagga. A number of motel units have been booked at this time, however, it is not foreseen that there should be any shortage of this type of accommodation. Reservations can be made by contacting Peter or Kevin. A special price will be available at selected motels.

Tours of the city and local attractions have been arranged for those not as keen on the amateur radio side of things. Shops in Wagga are all open on Saturday mornings until 12.00 noon, and many remain open to 4.00 pm.

Registration fee will be $10 per participant or family registration. The site for the convention is OURA, located 10 kilometres from Wagga Wagga. Communications on the day will be via repeaters 146.750, 438.675 MHz, or on HF 3.613, 7.165 or 28.490 MHz.

The club holds a regular sched on 7.165 MHz at midday on Sundays. More information may be obtained, if required, at that time.

—Peter Clee VK2KZZ, Publicity Officer, Wagga Convention

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WESTERN AND NORTHERN SUBURBS ARC Inc

The Western and Northern Suburbs Amateur Radio Club Incorporated, (previously the Western Suburbs Radio Club) holds its general meetings at 8 pm, on the first Friday each month at the Ern Rose Memorial Pavilion, Seaver Grove, Reservoir.

Club nets are held each Tuesday on 145.450 MHz FM at 0930 and on 28.470 MHz USB at 1030 UTC. VK3IYP (International Year of Peace) is the CLub call sign for 1986.

Officer Bearers for 1986 are:
President: Mark Stephenson VK3PI
Vice-President: Stan Taylor VK3DHN
Treasurer: Gordon Hall VK3YOD

—Submitted by Tom Page VK3AGH, Secretary

FAX FACTS

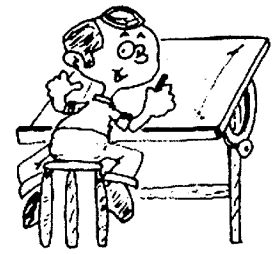
Demand for facsimile machines in Australia continues to rise and is expected to reach 30 000 in use this year and an estimated 100 000 by 1990.

Industry sources say businesses are rapidly recognising that FAC provides an inexpensive and quick means of document exchange. It takes 30 seconds to send an A4 document by FAX for the cost of a local call, or STD for long distance, compared with Telex taking five minutes at a cost of $2.

CLUB PORTRAIT

NORTH EAST RADIO GROUP

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131



The key elements of the North East Radio Group (NERG) are cheek, friendliness, activity and success. It is based in Melbourne's north- east suburbs, filling the geographic need for a radio club in the area.

NERG began when a number of radio amateurs, going to the annual Queen's Birthday Weekend Mount Gambier Radio Convention, in 1983, decided to form a club with the pure aim of winning the Convention's inaugural trophy.

The founders of the Group include Greg Williams VK3VT, Ewen Templeton VK3BMV, Paul and Brenda McMahon VK3DIP and VK3QT, Geoff Hudson VK3CGH, Ian Bryce VK3BRY, Greg Ahpee VK3BZQ, Gary Carlson VK3KBL, John and Victoria Griffin VK3ZGT and VK3BNK, and Hank De Jong VK3BLI.

Along with their blatant, premeditated scramble for club status, they had the cheek to pick a name not unlike the Convention's host club, the South East Radio Group (SERG).

NERG Secretary, Greg VK3VT says: "It was a stir to the SERG — there's certainly a friendly rivalry between the two groups now."

NERG won the Mount Gambier Convention Club Trophy in 1983, and again in 1984 — then SERG dropped it from their program! The Club Trophy was awarded to the club with the highest overall points score in normal events being held, plus two others — antenna raising and a wheelbarrow race.

NERG's winning streak continued at Mount Gambier with Greg VK3VT, winning the overall individual points score in 1985 and Richard VK3CRH/7CG, the 1986 winner.

The Group's other successes include the John Moyle Memorial Field Day Contest, which it first entered in 1984 to be runners-up, but in each year since has been section winner — and top scorer in 1986.

NERG club meetings began in the Montmorency High School in 1983. An attempt is made to keep administration low and activity high — and stay a friendly club.

The NERG attempted to work the Astro-Amateur, Owen Garriot W5LFL, in December 1983, only to be disappointed. They then produced an Owen Garriot dummy and publicised through the VK3BWI Broadcast for anyone who missed the Astro-Amateur to come to a NERG meeting and shake the dummy's hand.

Occasionally NERG has a construction night when they get someone who has made a particular item to come along and show everyone else.

The Victorian Fox-hunt Champion for the past eight years has been a NERG member and it has been said that NERGs are Australia's supremos of Direction Finding. The Group hold quarterly Sunday Afternoon Fox-hunts, mainly on HF, for those who want to get their feet wet in DFing. However, one readily suspects they use these trials to keep up their level of skill!

Planning is advanced for the 1987 Victorian Fox-hunt Championships, in February, which the Group says it is again organising to find the top Victorian Fox-hunter and to have a good time.

Novices classes were started in 1984, because the Group felt there was a need in that area and to simply promote amateur radio. The classes produced seven novices, and therefore seven new members in the first year, and there is a class of five in 1986.

Promoting the hobby is something the NERG do well and it has been the only club to volunteer and operate the Science Museum Demonstration Station, VK3AOM, on a regular basis.

One thing about the Nerg's 50 members is that most are active in club affairs, and are not just on the books as financial members.

Their approach to JOTA is somewhat unique. It set up a number of booths containing activities such as direction finding, sniffer hunting, radio teletype, HF operating and Morse code. The idea is for each booth (event) points are awarded and the top scoring scout troop wins the award for the day. This way, they learn a little more about amateur radio than just operating a microphone.

The Group was incorporated in 1985 due to the need to be a legal entity to enter into a lease agreement for a tower.

The NERG is moving quickly to establish its six metre repeater, VK3RMH, at Wattle Glen, as there are a number of six metre operators within the Group and it is hoped that the repeater will encourage use of the band.

And, what about the Group's emblem? Greg says: "We all think that's what a NERG would look like — a nice cuddly character who is fun to be with."

The Group, heard on air as VK3CNE, also issues a bimonthly newsletter *NERG News* to keep its members informed.

For further information contact NERG, PO Box 270, Greensborough, Vic. 3088 or phone Greg Williams VK3VT, (03) 606 7478 BH or (03) 435 7870 AH.

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WANTED

Any "RARE" recordings of amateur radio contacts for Volume 2 of "THE SOUNDS OF AMATEUR RADIO."

We ore particularly interested In recordings of contacts on bands not now available to Australian amateurs; eg 112 MHz, 288 MHz, etc. We are also looking for recordings of unusual contacts; eg from Balloons, Aircraft, Submarines, etc.

Any recording format can be handled from cylinders to CD.

In the first instance please write to:
PETER WOLFENDEN VK3KAU
c/- FEDERAL OFFICE
PO BOX 300
CAULFIELD SOUTH VIC 3162.

PLEASE DO NOT SEND RECORDINGS.

Copies of Volume 1 "THE SOUNDS OF AMATEUR RADIO" are still available for $7.00, plus post and packaging.

Inquire at your Divisional Bookshop or the Federal Office.

QSP

SUPER-MAGNET MAKES SMALLER MOTORS

An essential component of many motors is the large, heavy permanent magnet associated with the non-excited elements of the motor. *Magnequench*, a new product developed by General Motors, is about 25 percent stronger than any other known magnetic material.

Currently, the most widely used high-power magnets, composed of samarium- cobalt, are expensive and difficult to manufacture. But the new material is so low in cost that the auto-maker plans to use the material on starter motors in some cars. Only five ounces of the material are needed for the newly designed motors.

This tremendous saving in weight and size offers several benefits. Using a smaller, lighter starter, for example, simplifies design of the engine area. Using *Magnequench* instead of conventional magnets in all the control motors of a car would presumably produce a measurable effect on fuel economy as well.

Because samarium-cobalt is the material sometimes used to make very small, high-performance loudspeakers, it should be interesting to see if the speakers manufacturers put in our HTs get any better as supermagnets become more widely available.

—Reprinted from *ham radio* July 1986

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

DIVISIONAL NEWS

A vacancy has occurred on the Divisional Council. Mary Jane Douglas VK2CMJ, has married and now lives in the country near Coonamble. The distance made it difficult to carry out her council duties. Best wishes and thanks to Mary Jane for the future. . . .The 'Broadcast Survey' has been completed and a review given over the broadcasts. A written report will be included in a future *Minibulletin*. . . .The call sign VK2AWI is to be reactiviated and will be used to provide identification for operation from Amateur Radio House. . . .Scheduled activities in this coming month include the Divisional Dinner on Saturday, October 11, if the minimum booking level has been reached. Details have been given on the Broadcasts and last minute information may be obtained from the office during the hours 11 am to 2 pm weekdays or on Wednesday evenings 7 to 9 pm. Telephone (02) 689 2417. . . .Members are reminded that the latest Australian Call Book is available from the office, together with a range of amateur publications. Regrettably, the cost of the overseas publications has risen. . . .A reminder that JOTA will be held over the weekend October 18 and 19. Contact your local group or the Divisional Office if you can assist. VK2WI will rebroadcast the opening address from Canberra at 2 pm Saturday, if we are able to receive a strong signal to do so. . . .The next Conference of Clubs will be held on Sunday, November 2.

It was with regret that we learned of the passing, after a short illness in early August, of Brian Lavery, husband of our Administrative Secretary, Maureen. To Maureen and her family we extend our sympathy on behalf of all members.

WICEN

This month there is the annual operation to provide safety communications to the Canoe Classic, conducted on the Hawkesbury River over the weekend of October 18 and 19. . . .During this past year, the WICEN repeaters VK2RWS have undergone an extensive rebuild on the two metre side. New antennas have been installed and it is hoped that the original service area has been restored. . . .The postal address for WICEN is via PO Box 123, St Leonards, NSW. 2065, or mail may be left at the office for redirection.

DAYLIGHT SAVING

A reminder that, with the change to daylight saving later this month, the VK2WI Broadcasts observe local time — that is 11 am and 7.30 pm. The VK2TTY RTTY and VK2BWI Slow Morse practice will observe UTC time. Their transmissions will shift one hour by local time!

NEW MEMBERS FOR AUGUST

A warm welcome is extended to the following amateurs who were admitted to membership at the August Council Meeting:
N J Coleman VK2KJZ, North Sydney; R M Ellis VK2PGG, Lane Cove; L N Lindsay VK2CLL, Wauchope; C L McPherson VK2CLM, Port Macquarie; H M Pieremont VK2APD, North Epping; J B Robson VK2VUL, Edenson Park; J Sproule VK2XJS, St Ives.

SOUTH WEST ZONE CONVENTION

The Wagga Amateur Radio Club advise that the Annual SWZ Field Day will be held at the same venue as last year, at the Scout Camp near Wagga, over the weekend October 25 and 26. Further details may be obtained from WARC, PO Box 294, Wagga, NSW. 2650, or via the Sunday Morning Broadcasts.

While on Field Day dates, mark the Central Coast 1987 event for Sunday, February 22. This will be the 30th Annual Field Day on the Central Coast. The CCARC may be contacted at PO Box 238, Gosford, NSW. 2250.

PUBLIC LIABILITY INSURANCE FOR CLUBS

These notes were prepared in mid-August and at that time the interest and response to the proposed scheme had been poor.

VK2 DIVISIONAL LIBRARY

Aub VK2AXT, the Divisional Librarian, would like to thank the following for their donation of books and magazines:
VK2s OZ; NL; JTR; YTQ; CO; KYS; AUE and LW.

Special thanks to Mrs Court and Mrs Garland, for the donations of books from their late husbands to the library.

A recent addition to the library is a listing of current equipment modifications, surplus equipment modifications and circuit information which is covered in amateur magazines. In addition, a list of instruction and overhaul manuals which the library holds for commercial and wartime surplus disposals equipment.

This information is in a red covered folder on the QSL cabinet. If you intend purchasing a piece of equipment and would like to survey its performance data, call into the Parramatta office and look up the reference. Alternatively, you can ring (02) 689 2417 on either Tuesday when Aub is in attendance or on Wednesday evening when there is a Councillor on duty to ascertain if the review and/or the modification can be supplied.

The library cross-reference indexing which categorises articles appearing in amateur magazines into their respective group headings is currently being revised. This amendment covers all the articles appearing in the last 12 months of the various magazines.

The listing covering the library contents is also being progressively updated, with almost all the books now in the list. The popular magazines are now listed, but some of the rare and old issues are still being audited and listed.

The library has a comprehensive coverage of amateur books, electronic and computer magazines for your use. This coverage has been achieved by the many generous donations received, but to keep abreast of technology, there is still a need for books covering solid-state devices, application notes and technical books — new and old. The Librarian and Council is very appreciative of those who think of the library when disposing of unwanted literature and especially members who have the unpleasant task of disposing of the estate of a silent key.

This has been my mid-year report. If you have any request we will do out best to supply the data you request.

—73 Aub Topp VK2AXT — Divisional Librarian

A new service for members, which is being added to the library facilities, is a photocopying service for some of the data books. The details are still being worked out, but in essence it will be only by mail since the material has to be located and processed.

Limit of three items and you will need to cover the cost of return postage. By the time these notes appear, the conditions will be known. A copy may be obtained from the office or if you send in a SAE, a copy will be sent.

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VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

It is inevitable that regular nets held by clubs or a wide flung group of individuals and conducted on HF, will run into interference problems. The ideal place for nets is, of course, VHF and particularly, the two metre band. This automatically prevents novices from joining in and, in a very large state like Queensland, limits the participants to those in a relatively small area. So it is back to HF with the popular choice being 80 metres.

Let us consider some practicalities. To start a net, we must set a time, that is, a particular day and time. We must choose a frequency and then publicise that frequency. Having told everyone that this is the frequency on which to meet, we are stuck with it, plus or minus a few kilohenz.

The time comes and there is the frequency — occupied! What to do? You can move up or down a little or you can ask the occupants to shift. Remember that this is not your frequency, so remembering this, you ask, in the most polite terms, for the occupants to shift and most times they will. If they refuse, drop the matter forthwith.

On the other side of the fence, if you are on a publicised net frequency at net time and are asked to move politely, consider the foregoing and be aware of the net controller's predicament. By moving you will be showing the true amateur spirit.

In Queensland, a favourite net frequency and one of our VK4WIA broadcast frequencies is 3.605 MHz. Here is a short list of nets and times when they are on, and as the phone-patch Americans used to say, a clear frequency would be appreciated.

VK4 Disabled Persons Radio Club — Fridays, 0930 UTC on 3.590 MHz.
Gladstone Amateur Radio Club — Thursdays, 0930 UTC on 3.570 MHz.
Townsville Amateur Radio Club — Sundays, 0930 UTC on 3.605.4 MHz.
Queensland Club Net — Tuesdays, 0930 UTC on 3.605 MHz.
Queensland Net — Thursdays, 0930 UTC on 3.605 MHz.
VK4WIA News Re-Broadcast — Mondays, 0930 UTC on 3.605 MHz.
Gold Coast Amateur Radio Society — Wednesdays, 0930 UTC on 3.605 MHz.

ar

VK3 WIA Notes

NEW MEMBERS

A warm welcome is extended to the following:

Alan Bergman VK3CHX; A B Burgess VK3PKA; Tony Capuano VK3NTC; Geoffrey Chamberlain VK3AZI; Dudley Hart VK3PDH; Brian Keegan VK3CTT/VK3KPB; I J Stanley VK3CIS; Ian Stowe; George Strachan VK3HS and Brian Hallam VK3DBH.

ar

ILLEGAL RADAR

Components for a device to jam police radar speed guns are being sold in Melbourne and an American car magazine is offering mail order plans for a jammer.

Use of these devices could, under the Radiocommunications Act, result *in fines* up to $10 000, five years imprisonment, or both.

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

One of the "perks" of being President is being invited to visit some of the various affiliated clubs at their monthly meetings. Over the past couple of months, I have enjoyed meeting the SA ATV Group at their visit to the Educational Multi-Media Department, and the Adelaide Hills Amateur Radio Society at their *Buy and Sell Night* (from which I returned with a car load of 'bargains' and a several of centimetres added to my waist-line from the beautiful supper the ladies provided!).

More recently, I was invited to attend the Elizabeth ARC's AGM to chair their Election of Officers, and to draw their raffle. It was an "appalling" night (weather-wise) but inside the Water Tower on Kettering Road, the atmosphere was warm and friendly. The new committee of this small, but very keen group, are as follows:

President: Trevor Lowe VK5ZTJ
Secretary: Eddie Jennings
Treasurer: Vince Schwinger VK5ZSV

and the Committee Members — Sean Quigley VK5KSQ, John Cooper, and Rex Haskard VK5HO.

Yet another magnificent supper (more centimetres!) was provided by Hannah Jennings, Eddie's wife. If you live in the Elizabeth area (or even if you do not) and would like to join a friendly group, drop in at the Water Tower (Kettering Road, opposite GMH) any Wednesday night from 7.30 pm for general activities, or the first Saturday in the month for a meeting night, also from 7.30 pm. I can assure you that you will b made most welcome.

WOULD HAVE LIKED TO VISIT

One Club that I would have liked to visit in mid-Winter (although I understand that even they did not completely escape the cold weather), was Darwin. They also have a new committee comprising:

President: Bill VK8ZWM (better known, perhaps, as 'Spud', who I am told left immediately for VK4. Was it for advice or is the job really that bad, Henry?).
The Vice-President is Barry VK8DI, (who shortly afterwards was seen in Adelaide!). All jokes aside, we were pleased to have you and your father with us at the *Buy and Sell Night*, Barry.
Secretary: Larry VK8LM
Treasurer: Trevor VK8CO
Station Manager: Frank VK8FT

One member who will be sorely missed, but must deserve a well-earned rest, is Henry VK8HA. You may remember that Henry was awarded a 75th Medallion for his services to amateur radio in Darwin last year, and now, as he leaves the Committee, he has been awarded the first Honorary Life Membership ever to be given by the Club.

The Club will be 20 years old in November, and Henry has served on the Committee for at least 15 of those years, not only doing the job of President, but at the same time being the QSL Bureau Manager, the Intruder Watch Co-ordinator, one of the Sunday Morning Broadcast relay operators (every week), Slow Morse Practice Operator (almost every night!), Journal (Ground Wave) deliverer/postman ... what more can I say? Congratulations Henry, you deserve it.

WHY NOT COME UP?

At this years Clubs' Convention, the Lower Eyre Peninsula ARC put forward a proposal that the frequency 3.579 MHz should be designated a "Home-Brew" frequency. We felt that although it was an interesting concept, it was not possible to make it 'mandatory' but that it should be publicised and encouraged (my apologies for having taken so long) so, you Home-Brew enthusiasts, I understand that the crystals for this frequency are readily available, so why not come up and give each other a but of encouragement.

By the time you read this it will hardly be news, but on behalf of the Divisional Council and Members, I would like to thank Arthur Tanner VK5AAR, for volunteering to take over the job of Broadcast Producer. Each person brings to the job his or her own personality and no two are ever the same, so we look forward with interest to Arthur's style of production.

OCTOBER MEETING

It has been suggested that the meeting on October 28, be one with a historical theme, and to this end it is suggested that you bring along your favourite piece of "olden day" gear (if you have one) and be prepared so say a few words about it. Also, at the June meeting, our Historian, Ray Bennett VK5RM, promised to return with a list of the "Duties of a Historian" which were discussed at that meeting. So, here is his 'compilation' and it is suggested that you bring this list with you to the October meeting to discuss it further with Ray.

POSSIBLE ACTIVITIES OF AN HISTORIAN
(South Australian Division of the WIA)

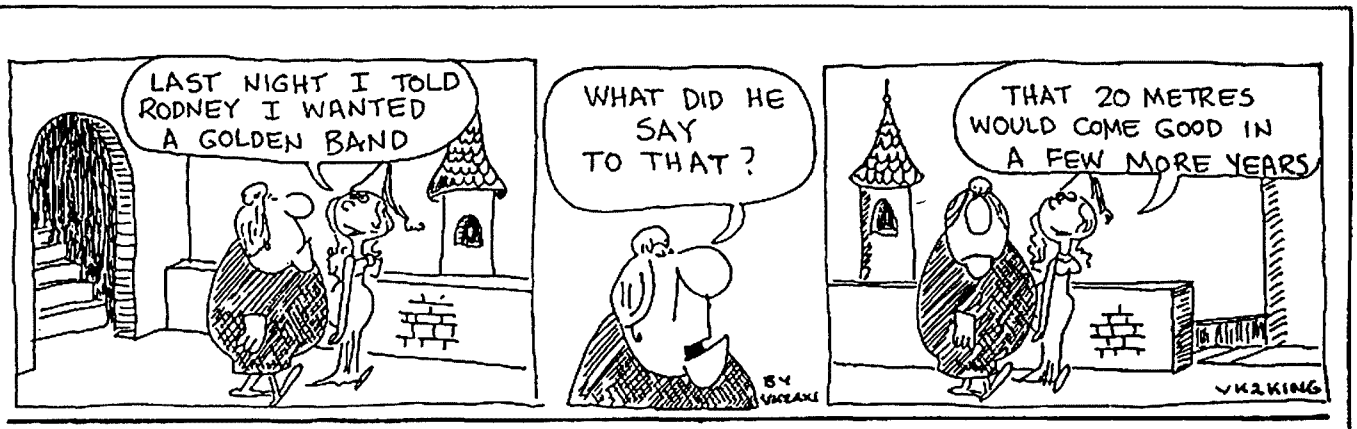
1. To accurately record for future reference those achievements in the art of amateur radio made by members of this Division, in the fields of VHF DX, ATV, etc, etc.
2. To prepare any publication or publications of an historical nature which may be of assistance and interest to members of this Division.
3. To bring such material as in 2 to the notice of members for their attention.
4. To record any section of the material referred to, for future reference.
5. To assist other Officers of this Division where inquiries of a historical nature are required concerning activities of members in the developments of amateur radio.
6. To prepare a short lecture for a selected monthly meeting, or whatever, if requested.
7. To assist officers and members of this Division in 'Spreading the Gospel' of amateur radio as a worthwhile hobby.
8. To assist the Historian/s of the other Divisions — or the Federal Body — In compilation of material, if requested.

—Compiled by Ray Bennett VK5RM
Divisional Historian VK5

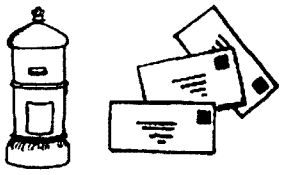
JUBILEE 150 AWARDS

354	VK6XC	442	K4BZV
355	VK3KJI	443	K4VPS
356	WA0GUD	444	KB2ACQ
357	VK3DME	445	WD9FEN
360	VK2EKO	446	KA8KEF
361	ZS4TV	447	AA4JO
362	VK2BHC	448	KA2TFM
367	VK5ASQ	449	KD5F
368	L50126	450	NG8Y
369	VK3DYL	451	K3ZPG
370	VK5NFK	452	KB8XT
373	VK2JGR	453	N6KGC
376	VK7BD	454	N3FAS
382	VK3KRL	455	W3IPY
386	N7DLJ	456	WA4QMQ
387	VK6NPZ	457	N8BEE
388	VK5KPJ*	458	KA0TWR
389	VK3NTC	459	W3AEC
409	KB5RF	460	K7DWT
410	WD5DOA	461	KA6IWW
411	N4NTN	462	K9GBN
412	W6EFR	463	KA7PPH
413	KA7APJ	464	KA7QBF
414	KB6GOZ/MM KL7**	465	KB6JXQ
415	N5HNS	466	KA7GJR
416	NJ9R	467	KB6DQ
420	KA7VJQ	468	KC5KW
426	N3ETZ	469	KA0UMJ
427	WA1FSD	470	K1ZZI
428	KC9YM	471	W8ATX
429	WA6HEX	472	KA0IVB
430	KB6JRI	473	KB9YY
431	WA5SWV	474	N5DER
432	KA9KHQ	475	K8MDU
433	KA0DFN	476	WA8URR
434	NC9I	477	KB1WR
435	W9IH	478	KA1DNB
436	KA0HSC	479	KY9D
437	WA9OAS	480	N6BSA
438	W7IOS	481	KA7DXU
439	KC7VG	482	N5FHR
440	K6OZV	483	N5GIW
441	K4CCV	484	N4HDT

** denotes first on ATV*
*** denotes first /MM*



Cartoon courtesy The Propagator



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

APPRECIATION FROM CHINA

The copy of *Amateur Radio* magazine received recently with the detailed article, *Introducing BY4 Able Old Men*, page 30, AR May 1986, sure put a tan on my cheeks. Anyone who might read the introduction would certainly have a complete picture of BY4AOM.

A personal visit to the station would not add much more information.

When I passed the article around to all the Old Timers, they gave a positive response and expressed their appreciation for the help in telling our old and new amateur friends that China's Old Timer Amateur Operators are still going strong and are back on the air again with an ever improving kick.

With the help of our old friend, Tom Wong VE7BC, we are putting together a linear amplifier with a two kilowatt input power. And if everything goes well, BY4AOM will be easier to copy in "the remotest corners of the world" we hope.

The band conditions these few months have not been very good for OX from our location. We could hardly hear any VK-land stations recently and the Stateside stations came in with a 5 x 3 signal and only around 0300 UTC, which is not a very good time for both sides.

73,

John Cieh,
Chief Operator of BY4AOM,
PO Box 227,
Shanghai, China.

ar

REEDMAN FUND

The Denis Reedman Fund has now been wound up and the following information is published for *the* benefit of members and donors.

Total Donations Received	$3702.59
Less Bank Charges, Stationery and Postage	$114.07
Balance	$3588.52
Cheque to Denis Reedman	$3578.20
Cheque to Salvation Army	$10.32

The amount paid to Denis covers his direct legal costs in full.

A big *thank you* to all who contributed collectively and individually to this appeal.

Sincerely,

Ron Swallow,
Greg Morrison,
Col Davidson VK2JCO,
PO Box 48,
Gladesville, NSW.

ar

FOR THE FIRST TIME

I recently took part in the 1986 Remembrance Day Contest. It was the first time for me as I had my licence for less than a year. The contest as a whole was a very enjoyable experience for me from start to finish.

My operating was confined to the two metre band as that is all I have equipment for and my efforts were rewarded by 175 contacts. While this may not sound like many, my time was divided between operating my own station and assisting the operation of a local radio club station.

For me, there was only one disappointment, the low number of operators actually participating in the contest. For example, the July 1986 edition ot AR gives the number of limited call sign holders in VK6 as 216. Including myself, I heard only 10 of these operators on the two metre band.

A quick look at the VK6 Z-calls in the 1985-86 Call Book shows an overwhelming majority of these operators live in the Perth metropolitan area, thus making them quite accessible on two metres. If 50 percent of these people made the effort and took part in the contest there would be no need for the "work you again in two hours" clause in the rules as there would be more than enough stations on the band to enable anyone to fill a decent log in a matter of a couple of hours.

Incidentally, the number of unrestricted operators heard on two metres was equally disappointing, but at least they had the excuse that they were operating on the HF bands. *Or were they?*

The RD Contest would have to be the easiest and most enjoyable on the contest calendar. It certainly gets adequate publicity — so how about it folks — next year just spend five minutes on the air and work your minimum of 10 stations and who knows, you may find yourself enjoying it.

Just call CQ-RD and I will give you a number and so will all the others who took part this year, I am sure.

Atek Petkovic VK6ZAP,
26 Freeman Way,
Marmion, WA. 6020.

ar

AUSTRALIAN RADIO HANDBOOK

I am in complete agreement with Drew Diamond as to the need for a truly Australian Radio Handbook which would cater for the needs of VK amateurs. Hopefully any constructional projects included in such a handbook would specify components which can be obtained in this country within reasonable limits.

I am sure there are many radio amateurs who are discouraged from venturing into home-brewing of instruments and equipment because of the difficulty in obtaining the components as specified in many overseas projects.

Also, with the increasingly high cost of equipment we could quite conceivably see a return to home construction of basic transceivers, particularly if good designs and instruction were available.

I would like to see other amateurs derive as much enjoyment from this facet of the hobby as I do and I think more local content is required to encourage and foster interest in home construction.

I would definitely buy a copy of such a handbook, if it became available and I hope the response to this suggestion is sufficient to encourage publication of such an Australian Radio Handbook.

Cordially yours,

Rob Abel VK2ERA,
106 Derwent Street,
Glebe, NSW. 2037.

ar

HELP REQUIRED

Three small items that I would like to comment on.

First, the standard of AR is very good. You are doing a fine job and I like the paper quality.

Second, in answer to the letter from Drew Diamond. Please register me as a purchaser of a technical book if it is published.

Thirdly, I find difficulty in defining when the Australian prefix changed on three occasions.

When I was first licensed in 1925 as 2JA, somehow I knew the prefix was A; ie A2JA. Then on the grapevine, because I am sure that I didn't get notification, I became OA2JA. Then it became VK2JA, but I see many conflicts in the use of the three prefixes and I wonder if anyone knows exactly when the A first come in and then the OA and later VK. I am very curious about it.

73,

Arthur Mead VK2JM.
13 Salisbury Avenue,
Bexley, NSW. 2207.

Can someone help Arthur, please. — Ed

ar

A letter has also been received from Mrs T M Brown VK3DYF, expressing interest in an Australian Technical Handbook.

HALLEY'S COMET

I forgot to write, after seeing the QSP about Halley's Comet in June AR, but would like to record my recollections of seeing the Comet.

I was just three, in May 1910, when my Mother took me downstairs into the yard on a cold, clear morning to see Halley's Comet. We had a clear view to the north-east and the Comet appeared to fill the sky.

The tail streamed out behind it as I remember on that date. Some may doubt that a three-year-old would remember it at all. I have had a standing joke with my friends for 50 years "that I want to live until 1986 and see Halley's Comet again."

Well, I did, and this time I saw it 13 times — ten from my home address with binoculars (7 x 50) and the others when I went on a bus tour in western New South Wales to Coonabarabran, Jilgandra, Narrabri, and Parkes. Two places had optical telescopes.

I believe the next sighting in 76 years will be a super-flop, but just wait another 76 years and it will be a "boomer!"

Arthur Mead VK2JM.
13 Salisbury Avenue,
Bexley, NSW. 2207.

ar

REGULAR CONTACTS WANTED

I am interested in setting up regular scheds with an Australian amateur. I only have 80 watts and no beam antenna, so a regular sched would be my chance for something more than a brief DX-type QSO.

I am very interested in learning more about Australia and it's people.

My QTH is Spokane, Washington and I am married and 30-years-old.

73,

Gary Stone KA7YXC,
East 603 Empire,
Spokane, Washington, 99207, USA.

ar

EGO BOOSTING

I am continually surprised by some people, knowing little and saying much, who push themselves to the fore to boost their egos, unaware it has all been done before.

A prime example was the letter in July *Amateur Radio* headed "Emergency! Are we ready?" Yes, Sam, we are ready and have been for many years. It seems that you are deliberately ignoring past history, both internally and internationally. We have always been able to handle emergencies as they have occurred. America certainly has never, as yet, played a vital part in any of our radio communications emergencies, so talking of America's vital role in Australia's emergencies is hog wash!

It seems that the expertise involved is of very low level. It clutters up two frequencies to pass traffic, when only one frequency should be used. Then the complaint about conditions, oh come on, all day every day? Sam really must have a poor receiver. Some stations, myself included, communicate with the USA and other overseas stations daily. But then, of course, we are not black box operators!

Regarding the Mexico City disaster, whilst appreciating the work involved in passing 600 messages via the telephone to the United States, I deplore the lack of expertise which necessitated this action. During that emergency I was in touch with my friends in Mexico City via Radio Teletype and AMTOR 16 times. I did not rush to the Mexican Embassy and fall over myself to offer my services. Nor did I use the telephone to get my traffic through. I used my radio as any experienced amateur would do.

Further, I see that Sam is going to start a "mail drop," whatever that is? I presume he means mailbox. That is interesting, are mailboxes and AMTOR something new? Maybe for him, but then he has only recently purchased his black box. Others do keep up with the state-of-the-art, and have been using AMTOR for the past five years. There has been a mailbox available for the last four years. It works very well, gives world-wide coverage, and is based in northern New South

Wales. Why have a proliferation of mailboxes, especially when the operator has no idea of how it is supposed to work, nor of the protocol of the system?

There is already a mailbox within 2 kHz of Sam's proposed 7 MHz frequency. Sam will succeed only in creating havoc on the bands. It is a pity that amateur radio has descended to a level where black box operators can write such inane letters.

It would be much better if such people inquired about what has gone before and modelled themselves upon some of the "old-timers" who really knew what radio was all about. It would do them good to discuss communications and other matters with those who have experience and expertise. They must realise that many people know more than they do, are worth listening to, and willing to help others.

So to the Sams of this world, please make sure you know what you are doing to amateur radio, before you burst into print with a lot of inaccurate comments. Perhaps it is merely ignorance. If so listen and learn.

Yours respectfully,

Syd Molen VK2SG
First AMTOR Station in Australia,
Over 40 years on the Air,
13 Pendle Way,
Pendle Hill, NSW. 2145.

The above has been somewhat abbreviated and slightly censored. Syd's feelings have obviously been hurt! —Ed.

ar

DO YOU KNOW JOAN ELEANOR?

Do any readers have any details of the *Joan Eleanor* transmitter/receiver which was used by OSS agents operating inside Germany in 1944/45?

The OSS required a radio that could operate securely inside Germany as opposed to those used by agents in the occupied countries which were not secure and which required trained CW operators. Wireless sets used by these agents survived in reasonable numbers but *Joan Eleanor* would be very rare.

It was designed by Steve Simpson and De Witt Goddard, who were officers with the OSS in London and in civilian-life were engineers with RCA. Simpson named the radio *Joan Eleanor* after two friends.

The only details I have are its size — 6.5 x 2.25 x 1.5 inches and weighing three-quarters of a pound. Power was by 'long-life batteries and it had a speaker microphone. The beam antenna 'opened out to one foot' whatever that means.

It required an open space in which to operate, which in view of its very high operating frequency and QRPp, is understandable. The 'modus operandi' was to prearrange scheds as to time and place with a Mosquito aircraft equipped with a larger, higher powered version of the *Joan Eleanor* — and with a then novel device — a wire recorder on which contacts were recorded for transcription back to the UK.

Contacts were made via beams projected vertically from the ground and downwards from the plane flying at 35 000 feet. This beam covered a circle at ground level of 40 miles. Once contact was made the aircraft had to fly inside the beam pattern of the ground signal to maintain contact.

The system worked well in almost total security and a lot of important information was passed in this way but that is another story. I am interested in the technical aspect and would appreciate any information readers may have.

B Bailey VK5KBY,
44 Chartbury Road,
Medindie Gardens, SA. 5081.

ar

LONELY BACHELOR AMATEURS

Here is a recommended cure for lonely bachelor CW amateurs.

Tune in to UZ0FWF on 20 metres any morning around 2230-2300 UTC and you are sure to meet any, or all, of the following:

Helen, Eugenya, Natalia, Era, or Elena.

They alternate on the key.

This is, apparently, a YL Club, with the QTH being Korsakou, on Sakhalin Island, close to North Japan. All are nice girls and good CW operators. There is only one snag — all are very short on 88, in fact, they don't seem to have heard of such a thing!

"Mac" McBratney VK5YO,
PO Box 151,
Blackwood, SA. 5051.

ar

FOLLOW-UP PRACTICE

Further to the letter from P H Gibbs VK3AQ, in August 1986 edition of AR, I write to support his comments.

Amateur radio is open to all who comply with the licensing requirements — thus there will be amateurs who are technically competent and to whom home- brew is a breeze, and there will be amateurs who are less technically knowledgeable who need to be encouraged and educated.

The latter group need all the support they can reasonably be given within our fraternity.

Technical skills which are developed by home-brewing are one of the cornerstones of our hobby and have the potential to act as a national resource in time of trouble.

I would encourage Divisions and the Federal Executive to pursue the matter of follow-up practical construction sessions further.

Yours sincerely,

Stephen Phillips VK3JY,
37 Mangarra Road,
Canterbury, Vic. 3126.

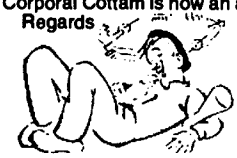
ar

HAPPY WITH THE BLIP

Going through my old Air Force books I came across a poem by Corporal B F Cottam published on November 28, 1944 in *Wings*.

Those of us who were Wireless Mechanics at the time will appreciate the poem. Perhaps ex-Corporal Cottam is now an amateur!

Regards



Noel Abel VK3YUO,
49 Rowallan Avenue,
Harkway, Vic. 3806.

Happy with the Blip by Cpl B F Cottam

Hi! there "Troppo by the Swamp" and "Blanky by the Sea"
And "Goin' Troppo down the South" — you all just list to me.
You say, you're goin' troppo — that makes me ruddy laugh
You ain't struck nothin' yet, me lads — no fear, not ruddy 'arf.

Now I'm a happy Signals Mech — ain't you 'eard o' that remark?
No! I don't live at Taronga Zoo nor yet at Callan Park;
But I'm a guy what looks at blips and makes the ergs to flow,
And then goes nuts and happy mit a fine bright bluish glow

Yes! I'm a guy what looks at things when things ain't even there,
And after when I'm off me shift I just sits still and stare.
Why! — Troppo! ! — Well! Gor strike me pink! It's just not in the race,
With a fellow that's in Signals with a bright blip-happy face.

Blip-happy! Lor', yer dreams of things that make a man fair sick,
You rant and rave and talk such rot they smites you mit a brick.
It's awful, blokes, it's crook, I says — so don't you winge no more
About your lot and what you do and things what makes yer sore.

'Cause a fella that's in Signals, he puts up with a lot
With ossifers and blips and things that drive him off his dot;
So please always remember — just take from me this tip,
Bein' troppo is a blessin' compared to "Happy with the Blip".

ar

HOW TO KILL OR BUILD AN ORGANISATION

When conditions on the amateur bands are bad or there is a sunspot minima as we have at present, Institute activity generally seems to decline. It is at these times when one hears complaints, rumours and other wild mutterings. It is a case of "Idle hands get into mischief." This state of affairs is common with all organisations, and at some stage or other when a general stasis applies a glorious lassitude pervades the membership in their attitude towards their club or organisation.

It is similar with the WIA and it is now that members should be wary — they should be bestirring themselves to create interest and not kill it. The quickest way to "kill" any rehabilitation process is to adhere to the following ten rules (with apologies to the US magazine *Popular Gardening*):

1. Don't come to meetings, but if you do, come late.
2. Find fault with the officers and other members; particularly on the air.
3. Never accept office; it is easier to criticise than to do things.
4. Nevertheless, get annoyed if you aren't appointed to a committee.
5. If appointed, don't attend the committee meetings.
6. When asked to express your opinion, say nothing but afterwards tell everyone how things should be done.
7. When others roll up their sleeves to help, say the Institute is run by a clique.
8. Never write a magazine article; it is too much of a bore.
9. Hold back on your dues as long as possible, or don't pay at all.
10. Don't bother about getting new members, but if you do, be sure they are moaners like yourself.

Fortunately, we believe there are very few Organisation Killers amongst us, but in times of inactivity, beware. The Organisation Killer is an insidious disease and can become an epidemic.

We would like to believe that every member of the Institute was the direct antithesis of the OK, and it does not really take any great effort to become so. Beware of that feeling of complacency that advises there are plenty of others to do the work. There is always some job in the Division you can do, and to quote the old proverb — *Many hands make light work*. Too often too much is left to too few.

So we suggest that you offer your assistance to your Divisional Council and you will find them only too willing to accommodate you in some way; don't be shy about coming forward to help when assistance is required — you may find you may hold an important office yourself in the near future; become a real Organisation Builder and not a Killer.

—Written by the WIA Federal Executive, *Amateur Radio* May 1964

ERRATA

"Practical Earth Resistance Measurements" by George Cranby VK3GI (July, p 10).

The author has asked us to make clear a number of points which, partly due to initial ambiguity and partly to editorial changes, are not quite as intended.

1. He makes no claim to have measured ground or soil *conductivity*, which is characteristic of a soil sample itself an independent of the electrode system. He *has* measured earth rod *resistances* in different kinds of soils.
2. In the sentence beginning "This effectively negated . . ." it would be better to continue ". . . earth leakage as a factor in the HV system protection."
3. Additionally, there was a typographic error in the last line associated with Figure 1. The dividing line was omitted and the denominator (2) was misplaced. It should have been

$$Rx = \frac{R_1 + R_2 - R_3}{2}$$

Silent Keys

It is with deep regret we record the passing of —

MR LES BROWN	VK3ARL
MR HARRY BUCKLEY	VK6HB
MR BILL DONOVAN	VK4AKV
MR JACK HARGREAVES	VK2DUL
MR LEN VELLA	VK6AVL
MR G WEODELL	L20383

Obituaries

HARRY BUCKLEY VK6HB

I wish to advise, with regret, that my brother, Harry passed away on July 16, 1986, after a long illness. He was 67 years of age and a bachelor.

He worked, until he retired, with the Department of Civil Aviation in Perth.

During the war years, Harry served with the Z Force in Queensland, but his whole life revolved around electronics.

In his younger days he had been active in all sports — cricket, football, golf, surf-skiing and even archery.

O Hamilton
ar

JACK HARGREAVES VK2DUL

The death occurred at his home at Tumut on June 22, 1986 of Jack, in his 79th year.

Although he had been in hospital on occasions during the previous few months, his death was sudden and unexpected.

He was born in Sydney on January 8, 1907 and spent his life in the Tumut district. Being a bachelor, Jack was a kind and devoted uncle to his four nieces and five nephews.

Jack was a foundation member of the Tumut and District ARC. His great love was radio and in 1982, after much study, he gained his full call. A significant achievement at 75 years of age. Jack's happy and cheerful disposition will be sadly missed at club meetings, as will his voice on the *Kookaburra Net*.

Jack is survived by his brother Arthur, of Sydney. To him and his family and relatives, deepest sympathy is extended.

—Vince Nugent VK2ALZ
ar

LEN VELLA VK6AVL

It is sad to report the sudden passing of Len on Australia Day, January 26, 1986, at York, Western Australia, at the young age of 63.

Len was born at St Julians, Malta on July 31, 1922. He joined the Cable and Wireless Ltd in 1940. In Australia he worked for the Overseas Telecommunication Commission.

He retired from OTC in 1982 after serving at Cocoa Island, Fanning Island, Guam, Cairns, Sydney and Perth, and immersed himself in his hobby farm at York, Western Australia.

Len attained his amateur radio licence in 1981, and was a member of the WIA, AARTG and was Communications Officer for the local State Emergency Service in York.

He joined the Maltese Amateur Radio International Society and became a very active member with its International Network.

Len was married with four children.

I first met Len on July 12, 1954 whilst boarding a ship in Malta for the voyage to Australia. He was the Welfare Officer for the trip from Malta to Perth and he disembarked at Fremantle. Over the years we lost track of one another until we made contact on the air in 1981. I was then fortunate to renew acquaintances with Len and his wife, Leonie, when I visited Western Australia during a Round-Australia trip in April 1985.

To Len's wife and children, the Maltese Amateur Radio fraternity world-wide extend their deepest sympathy.

Sam Galea VK2AKP/9H1GS
MARIS Area Director Oceania
ar

BILL DONOVAN VK4AKV

It is with great sadness that I record the loss of my friend, and the friend of many, Bill Donovan VK4AKV, who passed away very suddenly at his home on July 6, 1986.

I first met Bill some 23 years ago as a new call, VK4ZBD, on two metres, but I could not foresee then the many enjoyable hours I would spend rag- chewing with this fine amateur.

Although he did not come into the amateur field until relatively late in life, he did so with great activity, but still found time to do duties with the WIA, Brisbane VHF Group and the Brisbane North Radio Club. The latter seeing fit to honour him with a life membership for his services as President and Class Manager, in which office he helped many to obtain their calls.

He was always ready to give a helping hand and greatly assisted at many antenna raisings and servicings.

No matter how crowded our bands may be in the years to come, I have no doubt that many will find there will always be a large blank space that occurred when Bill went Silent Key.

F Pattiford VK4ZAA
ar

THOUGHT FOR THE MONTH

It is never too late to be what you might have been.

QSP

AMATEUR RADIO — What it's all about

Amateur radio is the use of radio communications in all its forms as a hobby. There is in excess of 16 000 licenced operators in Australia and about one million internationally.

What is the difference between amateur radio and CB?

There is a great difference between the two: CB radio gives reliable communication for a limited radius with many restrictions on the type of equipment used whereas a licenced amateur operator can operate with a wide range of equipment including television and radio-teletype with much more power levels on up to 20 different bands from broadcast stations to microwave frequencies.

How far will you get with amateur radio?

Different bands have different ranges at various times of the day, the operators consider how far and when they wish to communicate and select an appropriate band to transmit on. In this fashion fairly reliable contact can be made to anywhere in the world.

Must you have a big antenna to operate?

Not necessarily, antennas come in all shapes and sizes for any given band, though a good rule is the higher the frequency you operate the smaller the antenna becomes and the less range you have. For most overseas communication large rotatable antennas are used as they give the ultimate performance but simple single wire antennas are quite effective.

What else can you do with amateur radio other than talk?

Talking to other operators is only one aspect of the hobby, operators are permitted to experiment with and construct their own equipment in many fields. Some examples are:

RADIO TELETYPE: Usually called RTTY, this mode allows communication by the typewriter keyboard using readily available ex-commercial telex machines.

AMATEUR TELEVISION: The transmission of colour or black and white television, both direct and via repeaters is an increasingly popular pastime.

SLOW SCAN TELEVISION: Allows one to transmit and receive pictures on black and white or colour from around the world.

REPEATERS: For operators on the road, a system of over 100 repeaters on mountain tops across Australia receive and re-transmit signals to greatly extend the range of mobile operations.

QSL CARDS: Upon making contact with distant or rare stations, it is customary to acknowledge contact by sending a personalised type of post card called a QSL card. Many operators make a hobby of collecting these cards from all over the world. These can be sent through the Wireless Institute of Australia's Divisional QSL Bureaus at moderate or no cost to members.

How do you become an amateur operator?

To become an operator you must obtain a licence from the Department of Communications by passing a combination of radio theory, regulations and Morse Code examinations dependent upon which of three classes of licence you wish to obtain — either Novice, Limited or Full.

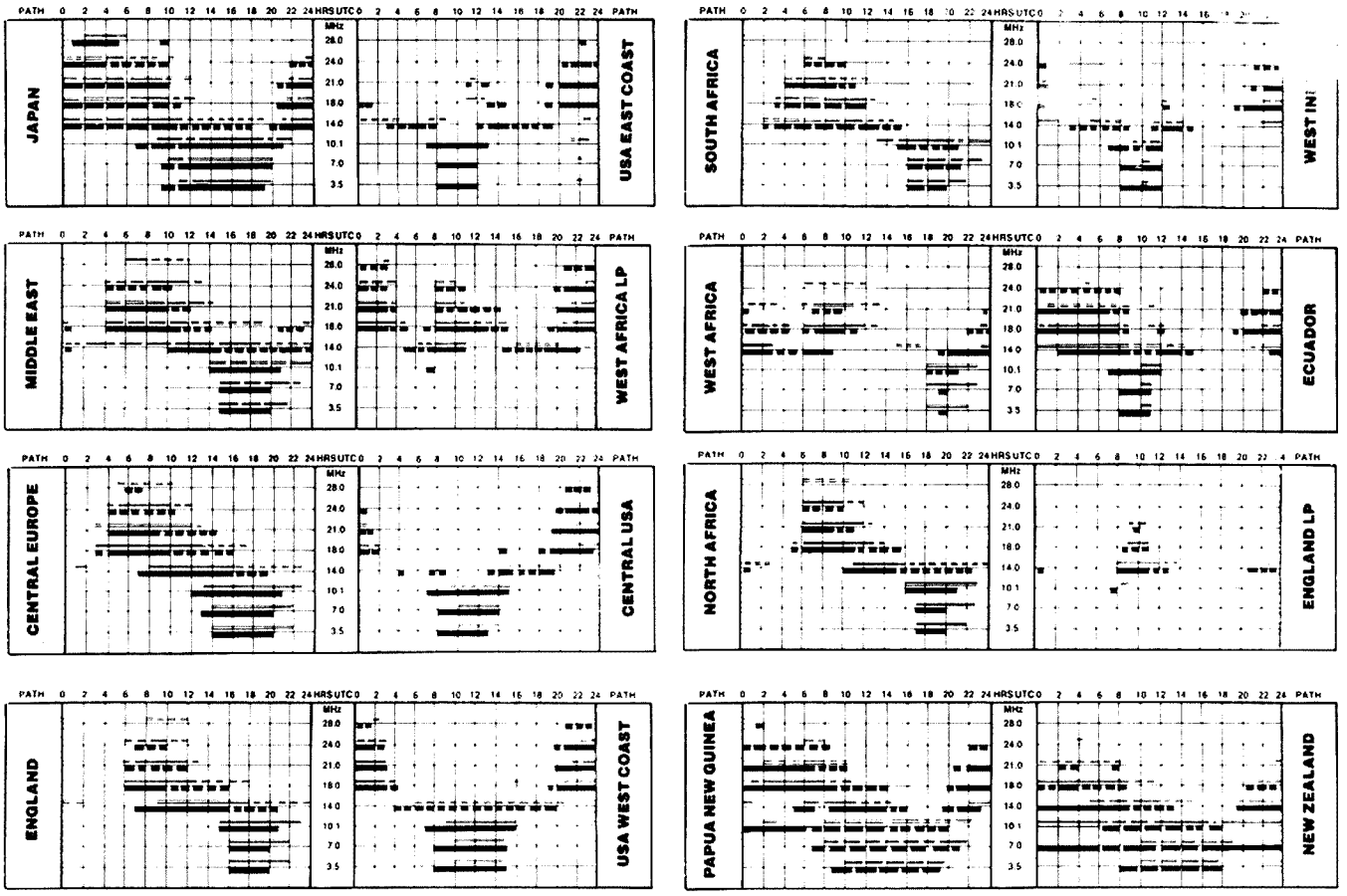
Examinations are conducted by the Department every three months. There are many courses run by the WIA, clubs and schools to assist with this. For details, contact the Department of Communications, the WIA, or your local radio club. Correspondence classes are also conducted by the WIA.

Once established, the amateur can play as active a part in the hobby as desired. There is no way of knowing where this exciting pastime may lead!

—Adapted from material supplied by the *Gippsland Gate Radio and Electronics Club*

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Hawkner Vic. 3060



LEGEND
From Western Australia (Perth)
From Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

FEES RISE

Radio communication licence fees increased from October 1, 1986 by an average of between seven and 10 percent, but in some instances, fees have been reduced.

The Department of Communications (DOC) in its Federal Budget Press Statements said the 16 300 licenses in the amateur radio service, under the single listing of "Amateur Station" increased $3 to $26.

CB licenses, which number 175 799 are now $13 — an increase of $1.

Revenue derived from the use of the spectrum is estimated at $33.161 million — which compared with DOC's total 1986/87 budget of $36.9 million, an increase of $4.1 million or 12.5 percent.

The Minister for Communications, said a shortage of frequencies for land mobile services in Melbourne and Sydney meant that new applicants for use of mobile frequencies in these cities would either have to share a channel or pay a fee of $2,130 for exclusive channel use. This will encourage the sharing of channels and other spectrum efficient practices.

Full details of the new fee structure are available from DOC Offices in all State capitals and District Radio Inspector's Offices in 20 regional centres.

—Submitted by Jim Linton VK3PC

Solar Geophysical Summary

JUNE

SOLAR

The solar activity was very low with no energetic flares observed. The visible disc of the sun was virtually without spots for the entire month, only small spots appearing for brief periods on the first and eighth. The low level of solar activity was reflected in the low value of the 10 cm flux, which reached a peak value of 70 on the 14th. The monthly average of the 10 cm flux was the lowest since the last solar minimum.

The 10 cm flux readings were:
1=69; 2,3=68; 4,5=67; 6-8=68; 9=69;
10-13=68; 14=70; 15,16=69; 17,18=68;
19-21=67; 22=68; 23=67; 24-30=66.

The average was 67.5.

The sunspot average was 0.8 and the running yearly average centred on December 85 was 15.4.

GEOMAGNETIC

The month was generally quiet except for the period 27-28 when a minor storm occurred. This was caused either by a recurrence or was the result of a filament eruption on 22nd. A=27,21.

—From data supplied by *Department of Science IPS Radio and Space Services* — June 1986.

DEADLINE

All copy for inclusion in the December 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 20th October 1986.

HAMADS are a FREE service to MEMBERS of the WIA

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non- members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIOON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105x 220mm SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

BLUE COVERED WILLIAM ORR RADIO HANDBOOK. Prop- Pitch motor. Valve bases for 813. Tcvr TS-620S. Maurie VK2DCD, PO Box 72, Coleambally, NSW. 2707.

KENWOOD AT-120 ATU: for mobile installation. Cress VK2CC, QTHR. Ph: (02) 631 3186.

ROLLER INDUCTOR: 30 µH; in good condition. Philip VK2EPC, QTHR. Ph: (02) 660 6734.

UTILITY X BEAM HUB CASTING: one wanted by VK2ALZ, QTHR. Ph: (069) 47 2198.

YAESU FT-780R: 70 cm all-mode or equivalent. Good price paid. Also 500 W antenna tuner wanted. Larry. Ph: (02) 949 3124.

WANTED — VIC

FRG-7000; FRG-7700; KENWOOD R1000/R2000; REALISTIC DX 400 (not 302); ICOM IC R70: Any of the above to swap for complete CB station in very good condition. See sale ad Vic. John L30479. Ph: (058) 21 0846 AH.

INVITATION: to Clubs or Groups to supply details of their history, aims, activities & services so as a Club Portrait can be written as part of a series of profile articles in AR magazine. Please post information, including a contact name & phone number to Jim Linton VK3PC, QTHR.

KENWOOD MC-50 DESK MICROPHONE: Contact VK3OM, QTHR. Ph: (03) 560 9215.

STUROY METAL TRIPOD: capable of holding antenna pole for small beam. 6m linear, (home-brew will do) & wind generator 12V suitable for portable use. Also neon sign transformer in working order. Ken VK3AJU. Ph: (03) 527 9029 or (03) 857 8054.

WANTED — QLD

ONE 690R: including or excluding matching PA. VK4JHM, PO Box 849, Atherton, Old. 4883. Ph: (070) 91 3219.

INFORMATION: to put a SSB SBE-IV 23 channel CB onto 10 metres. Bill VK4VHD, QTHR. Ph: (074) 22 2695.

WANTED — SA

YAESU FT290R: 2m all-mode tcvr. Must be in mint condition. Ivan VK5QV, QTHR. Ph: (087) 25 5514.

FOR SALE — ACT

70 cm LINEAR CORONA HP-120 UDX: with GaAsFET preamp. $550. Toyko HP power 70 cm GaAsFET low noise mast-head preamp. $260. Ralph VK1RK, QTHR. Ph: (062) 81 0203.

FOR SALE — NSW

COLLECTORS ITEM: Radio & Hobbies in Australia magazines. Bound into year books for 1953-1954; 1955-1956. Also Radio & Television Hobbies in Australia for 1959. All bound for each year, comprising 5 volumes. Best offer. VK2URT, QTHR. Ph: (043) 41 7693.

FT-200 TCVR: no mods, good condition. H/B power supply, manual, some spare tubes. $200. Model 15 TPTR. Exc condition. 110V xfrmr $25. ST5 RTTY terminal. $25. VK2ALZ, QTHR. Ph: (069) 47 2198.

ICOM IC-740: FM module fitted. WARC bands & PS-15 original supply. Hand mic & desk scan mic. All in perfect condition. Manuals. $1090 ONO. VK2BPO, QTHR. Ph: (02) 713 1831 AH or (02) 568 2085 BH.

ICOM 740 HF TCVR: $650. Icom PS15 power supply. $110. Yaesu FC700 ATU. $95. Icom SM2 desk mic. $30. All equip as new & with manuals. Peter VK2DEH, QTHR. Ph: (02) 452 4302.

ICOM IC-R71A RX WITH FM: Dressler active ant. Emtron ATU, microwave modules, 2 & 6m converters. $1100. Ph: (049) 69 4281.

KENWOOD R-2000 COMMS RX: ex cond. No mods, no faults. $560. Kenwood TS-7850, 50W FM 2m tcvr. Approx 6 months old. $550. MFJ-1224 RTTY modem. Suit Com.64. Ex cond. $260 ONO. Steve VK2KSR. Ph: (02) 709 2826.

PEARCE SIMPSON AM; SSB; CB: with power mic plus handbook to modify to 10m band. $85. Midland home-base port & mobile 23 ch CB. Very compact (AM) $65. AM/FM broadcast band rx. AWA model ST.06. $80. Thumbwheel switch. C&K type. 3 wheels, 9 positions. $20. 50W SWR meter $70. Arisc power supply. 13.8V, 2A. $85. Ext RF amp with 20 dB gain suitable for novice. $40. VK2CJV, QTHR. Ph: (02) 809 5024.

QUAD: 2-bands, 10 & 15M, 2 el. Wooden cross arms, wire elements, no matching devices. On a 6' tubular boom. Buyer to remove. $40 ONO. VK2AXT, QTHR. Ph: (02) 635 4384.

SATELLITE ANTENNA SYSTEM: 2m, 2 x 8 el. Incl phasing harness, left or right-hand circ polarisation. 70 cm, 2 x 14 el. Incl phasing harness, left or right-hand circ polarisation. Fibreglass stacking boom. $450. VK2BKQ, QTHR. Ph: (02) 848 8781.

TRIBAND BEAM CE-35LX: still in box, new. $320. CW auto keyer $15. 2m conv. $25. HF linear amp; suit FT7. $220. O/D telephones $25. Valves; tx & rx all types. WWII mine detector $60. All items ONO. All types books; AR, 73, CO best offer. Ph: (043) 96 4553.

YAESU FT-ONE & TUNER: both in perfect condition. Tcvr complete with optional filters, RAM & FM board, one desk & one hand mic. Complete with all manuals in original packing. Prefer to sell units together. Asking $2575 with 20m coax thrown in. Suit new buyer. Matthew Ryan, St Francis' College, Leeton, NSW. 2705. Ph: (069) 53 3622.

YAESU FT-707 TCVR: WARC bands. Mint condition. Unmarked in original carton with manuals. Fitted with narrow CW filter. Yaesu YM-35 microphone. Yaesu FC-707 antenna tuner, also in mint condition. $770 the lot. Kenwood VB-2530, 2m 25W FM amplifier as new. $85. VK2TAM, QTHR. Ph: (02) 871 4826 AH or weekends

FOR SALE — VIC

AUOIBLE SWR METER: cost $87; never used, $50. Icom 490A, 70 cm. $600. Used twice. VK3WX, QTHR. Ph: (03) 25 6340.

COLLECTORS BOOKS: ARRL Handbooks, 1945, 1947, 1951, 1959 $10 each. Command sets. 1957 $5. Fundamentals of SSB, Collins. 1960 $5. RCA transmitting tubes. 1938. $4. Icom IC-25A 2m FM. 25W op 2 VFOs, 5 memories. With instr book & complete workshop manual. In good working order. $300. VK3OM, QTHR. Ph: (03) 560 9215.

COMPLETE (ALMOST) SET of R&H RTV&H EA: 1950 to 1980. 3 missing. Some bound. Offers. Geoff VK3ACZ. Ph: (050) 24 5987.

COMPUTER: TRS-80 coco 64k extended Basic. Some cassette software, including Logbook. Original packing. Ex cond. Les VK3PYD, QTHR. Ph: (050) 24 1361.

HEATH SB-230 LINEAR AMPLIFIER: 80 to 10m at 1 kW input with Eimac 8873 final. Very little use & in excellent condition. Manual provided. $650. VK3IH, QTHR. Ph: (03) 584 1610.

HF COMPACT LOOP-TYPE ANTENNA: TET model OPL-4 covering 7, 14, 21, 28 MHz. For anyone living in apartment house, condominium flat or unit. Fits on handrail. 1.7m wide, 1.2m high. Purchased new & only used to test, but unsuitable for my location. Half price $75. Doug VK3VXY. Ph: (059) 75 5024.

GENERAL ELECTRIC: AM/SSB 40 channel CB. Current model in very good condition. $200. Oskerblock SWR-200 SWR/PWR meter. 4 months old in excellent condition. $100. Werner Wulf 11 metre vertical. Good condition. $40. 13 metres of RG 8U coaxial cable & plugs. $20. Will swap the above for shortwave rx ol similar price & condition. John L30479. Ph: (058) 21 0846 AH.

PLESSEY CARTRIDGE MACHINES: 2 only model no CPM-2. Needs some attention. Hills dual polarisation antenna, model FCIC, Tuned to 91.5 MHz. Otari reel-to-reel tape recorder (working). Needs new power lead. All equipment is ex-radio station equipment. No reasonable offer refused. David VK3KGF Ph: 743 6866 BH or 743 6992 AH.

YAESU EQUIPMENT: FT101ZD tcvr. $850. Desk mic, YD844A. $55. Both items & manual for tcvr in perfect condition. L31285, OTHR. Ph: (03) 29 4314.

FOR SALE — QLD

COLLINS 75S1 rx: fitted with additional 800 Hz CW filter. Collins 32S1 tx, 516H-2 pwr supply. All units in very clean condition & good working order. Instruction manuals included. Will ship at buyers expense. Total price. $650. VK4VK, QTHR. Ph: (075) 38 7152 after 6 pm.

KENWOOD TS-820S TCVR: S/no 740948. Fitted "Ham Radio" mods for 10 & 18 MHz & CW netting. With VFO 820 S/no 750499. Service & operating manuals, mod details, 3 spare valves, mic & leads. $500. Dennis VK4ADY. Tin Can Bay. Ph: (071) 86 4492.

YAESU EQUIPMENT: FT200 HF tcvr with match power supply. 80- 10m SSB & CW including mic & handbook. Mint cond $250. FRG7700 rx. 0-30 MHz compete with handbook. As new. $425. Ron VK4EV, QTHR. Ph: (07) 355 4308.

FOR SALE — SA

COLLINS 75A4 RX: with spare tubes. $125. VK5BS. Ph: (08) 295 3249.

KENWOOD TS-120V HF SSB TRANSCEIVER: Unused. $400. Ph: (08) 383 0071.

RADIO TUBES: 4-65A; QE3-300; 829B & socket; 815; (4E27/8001) VCR139. Two sets tubes KW 2000. AM tx 160m-50 MHz. Old BC radios (working). 150 various tubes. VK5LC. Ph: (08) 271 6841.

Advertiser's Index

October Australian Electronics Monthly

with Elektor Electronics incorporated!

We believe one of the fundamental roles of an electronics magazine is to provide ***brain fodder*** for enthusiasts and engineers, hobbyists and hardware hackers, amateurs and audiophiles.

Practical projects and articles that stimulate the mental 'taste buds' and satisfy the cranial cravings, are ever in demand.

Our reader survey showed that you purchase a wide range of magazines each month, seeking ever more brain fodder. By far the most popular and widely respected of the international journals was ***Elektor Electronics.***

Hence, to bring you more brain fodder, we obtained the rights to publish a substantial part, of local relevance, from the monthly issues of the UK edition of Elektor Electronics.

From the October issue, we'll be adding to the magazine a special ELEKTOR ELECTRONICS SECTION featuring:

- More projects! From one of the world's most widely read and respected electronics magazines.
- More features! To explain the new technologies and developments as they arrive.
- More articles! Covering the technologies and application techniques of devices and circuits.

Will components be checked for local availability?

Yes. Prior to publication we will seek out sources of component supply where necessary and/or suggest suitable substitutes.

Will project pc boards be available?

Yes. We will be making pc boards available for the Elektor projects we publish through our normal PC Board Service, along with our own project pc boards as usual.

Is it going to cost more?

Yes it will. From October, our cover price will be $4.75.

But, if you already buy Elektor and AEM, as we know many do, instead of paying $8.05 total, you'll get BOTH magazines for the price you were paying for Elektor alone! If you're the sort of reader who buys those magazines which have contents of interest to you that month, now you'll get more for your money AND spend less!

HERE'S A PREVIEW OF OCTOBER'S ELEKTOR SECTION

INDUCTORS IN PRACTICE

In spite of their apparent simplicity, inductors none the less often pose problems, because invariably they cannot be obtained ready-made (ie they have to be designed, and wound by the constructor. This article aims at removing some of the obscurities surrounding this subject and showing that making an inductor is not such a daunting task as some think.

LOUDSPEAKER IMPEDANCE METER

A simple, yet interesting and useful, instrument for measuring the resistance and the inductive reactance of a loudspeaker.

UNIVERSAL PERIPHERAL EQUIPMENT:

SERIAL DIGITIZER

Have you ever wished it were possible to read analogue voltages on your computer while sighing in dismay at the intricacies of bus connecting the design of your choice?

This design of an eight-channel analogue-to-digital converter board goes round the hardware problems by utilizing the computers serial IO port, and so becomes a universal unit for straightforward incorporation in almost any type of computer system.

Australian Electronics Monthly is edited by Roger Harrison VK2ZTB and published by Kedhorn Holdings, Fox Valley Centre Cnr Fox Valley Rd & Kiogle St Wahroonga 2076 NSW

More BRAIN FODDER

— with Elektor Electronics incorporated in Australian Electronics Monthly — coming October!

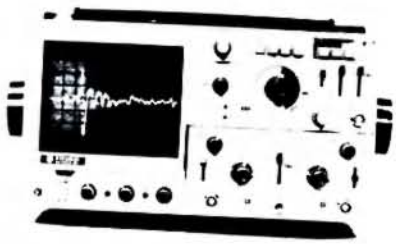
LOUDSPEAKER IMPEDANCE METER

A simple, yet interesting and useful instrument for measuring the resistance and the inductive reactance of a loudspeaker.

UNIVERSAL PERIPHERAL EQUIPMENT: SERIAL DIGITIZER

Have you ever wished it were possible to read analogue voltages on your computer while sighing in dismay at the intricacies of bus connecting the design of your choice?
This design of an eight-channel analogue-to-digital converter board goes round the hardware problems by utilizing the computer's serial IO port, and so becomes a universal unit for straightforward incorporation in almost any type of computer system.

STORAGE OSCILLOSCOPES



Conventional (real-time) oscilloscopes cannot capture very low signals, such as, for instance, the charging curve of a battery or the sawtooth waveform of an AF wobbulator. Nor can they cope with infrequent events, such as noise pulses. They also do not allow a comparison to be made of events that happen at different times. All these drawbacks are absent from storage oscilloscopes.

- More projects! From one of the world's most widely read and respected electronics magazines.
- More articles! Covering the technologies and application techniques of devices and circuits.

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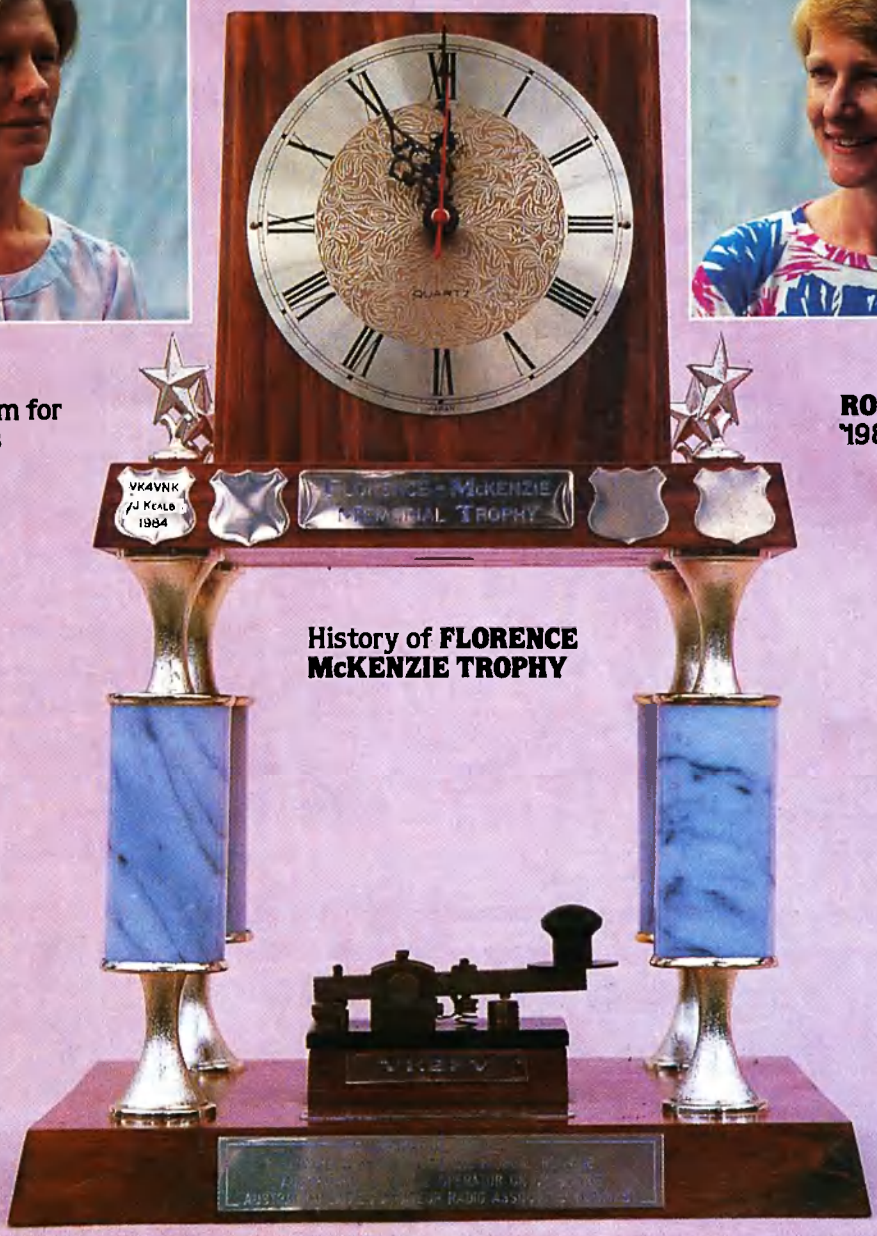
Amateur Radio

VOL 54, No 11,
NOVEMBER 1986

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

Computer program for **AC/DC** equations

ROSS HULL rules for '1986/7



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RTTY TEST GENERATOR to construct

IN THE PURSUIT OF EXCELLENCE, THE RESULT IS . . .

R. F. AEROSPACE

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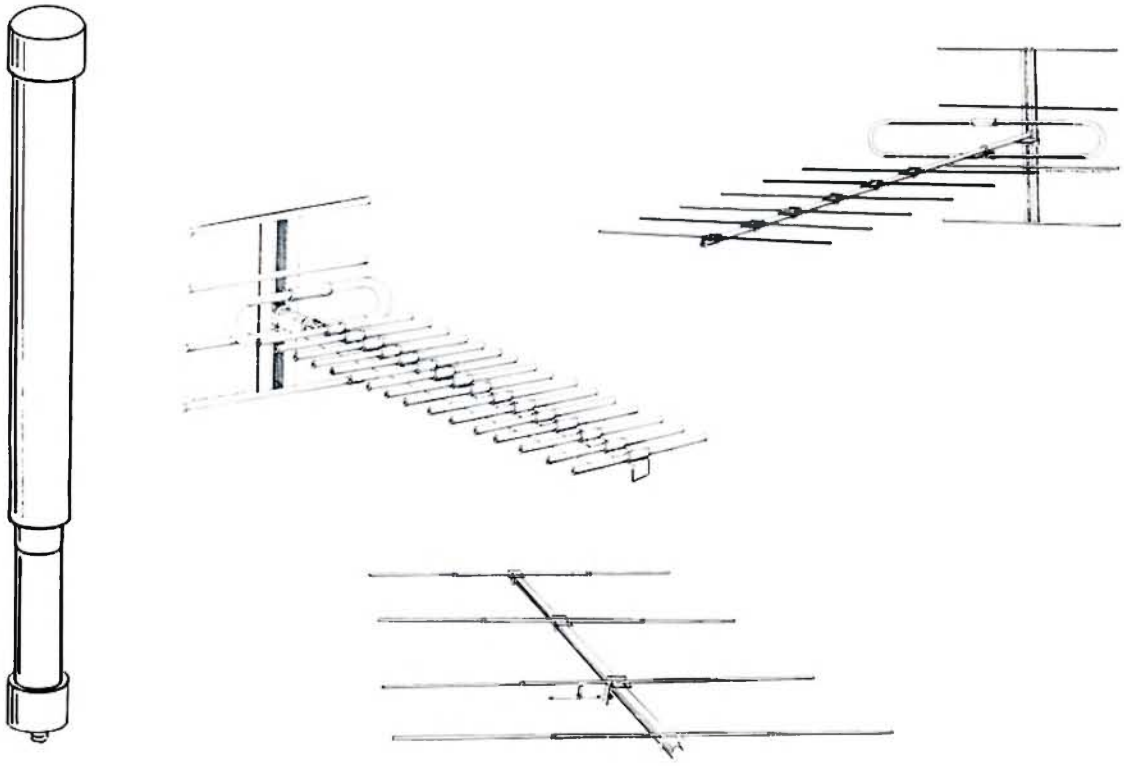

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STORES ACROSS AUSTRALIA AND NEW ZEALAND

DESIGN KEN McLACHLAN VK3AH

Cover photograph features the Florence McKenzie Memorial Trophy, together with Jill VK4ASK ex-VK4VNK, (left) and Wendy VK4BSQ.

Amateur Radio

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Special Features

Technical Features

Regular Features

Try This

Catering for the RTTY enthusiast there is a fine project from another avid home brewer, who has a shack which is a sight to behold. It contains 90 percent of all the 'goodies' that have been designed and built by Peter VK3AZL, a member of the Publications Committee.

Computer orientated? This program with a description of how it operates is a must for you. Joseph VK7NJO, has produced an excellent article of how to solve 10 options of AC and DC equations that every amateur forgets from time to time.

Bob VK7KZ, with members of his family journeyed to the United Kingdom and caught up with Jack Sykes (refer p49 July AR). It is an interesting story and with AR at heart, Bob wrote about his visit to see Jack and came away with an unusual but true story that Jack would like to share with the readers of this magazine.

For those contemplating travelling overseas, a list of countries that have reciprocal licensing arrangements with Australia's administration should be of interest. One may find it on page 22.

Other items of interest in this months issue, apart from the regular columnists, include an equipment review on the FRG-8800 receiver, Know your Second Hand Equipment, the newer and most popular segment Technical Mailbox, (further queries are still required), an article on the WWII T28 transmitter and Jim VK3PC, has a Club Portrait on another Club. Jim, is looking for other clubs to portray and he may be contacted at QTHR.

DEADLINE

All copy for inclusion in the January 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 10th November 1986.

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Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162,** *by the 20th day of the second month preceding publication.* **Note:** *Some months are a few days earlier due to the way the days fall. Watch the space below the index for deadline dates.* **Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

A FUTURE FOR HOME- BREW?

There has been for many years an attitude towards building one's own amateur equipment that "it just isn't worth the trouble any more". We have heard such arguments for a long time now as:

"You can't get the right parts any more",
"Why build gear, perhaps taking years to finish it, when you can earn enough to buy commercial stuff in a few weeks?",
"You can't build anything that looks half as good (or works half as well) as the commercial rig",
"The commercial equipment is so compact and/or versatile. How can you build anything so small or complex?"

Many of these arguments seemed unbeatable until quite recently, but I would like to suggest that the climate is now changing. Let us not forget that the Amateur Service is unique in that its individual operators are legally entitled to build their own radio equipment. All other services either depend on type-approved commercial products or employ their own engineers in their own dedicated workshops. Most of us are not electronics engineers, but unlike operators in the other services we have earned the right to home-brew by passing technical examinations which demonstrate at least the beginnings of competence to build equipment to meet our requirements. Like all rights, this could be lost if we cease to demonstrate the need for it. It has been proposed in Canada, for example, that only the highest grade of amateur licence should carry the right to build one's own. The well-known saying "Use it or lose it!" applies here too.

How has the climate changed? One of the biggest factors is the major shift in exchange rates between Australia and the rest of the world over the last year or two. This has made imports much dearer, but the other side of the coin is that our exporters are now much more competitive. Not only does this mean that it's now more attractive to build here rather than buy from overseas, but Australian manufacturers are beginning to tackle the overseas markets in which hitherto we were over-priced. The August issue of "Electronics News" has a front-page story about the expansion of local industry. Development of new products has doubled in four years. "In-house" rather than imported technology is coming up fast. It may not be long before we once again have a significant components industry. All of these factors are bound to "rub-off" into the amateur field, particularly since many of our "professional amateurs" are involved in this industrial expansion.

There was a recent proposal (by VK3XU, one of our more prolific home- brewers) that we should have an Australian "Amateur Handbook", in which design and construction using locally available components should feature largely. We have had a number of letters indicating willingness to buy such a publication. Hopefully, before long, we may be able to assemble a team of technical authors to write it. Any offers? We may never reach the exalted standards of the ARRL or RSGB Handbooks, but it would be worth a try. Can we do it? Will there be a resurgence of amateur home-brewing? Maybe, right now, it's all starting to happen!

Bill Rice VK3ABP

Editor

WIA News

GENERAL MANAGER

Critical to the effective operation of the Federal organisation of the Wireless Institute of Australia is its full time manager.

The Executive has recently reviewed that position, in the light of the changing requirements of the Institute. It concluded that as well as a need for the management of the business affairs of the Institute, there was a technical aspect of the activities of the Federal Executive that also had to be met. An increasing number of matters involving the Department of Communications and requests from members require at least a technical background.

Accordingly, the Executive has decided to identify its full time manager as the General Manager of the Wireless Institute of Australia. The Radio Society of Great Britain gives the same title to its senior employee, a title that is consistent with the qualification required.

Earl Russell VK3BER, has been appointed the first General Manager of the Institute, as well as its Secretary.

Earl has been an amateur for 16 years, and has recently retired from a Governmental Department where he worked in the communications area for 33 years. He is eminently qualified for the position, having been acting as Business Manager for the last seven months, during the absence of Reg Macey.

The Federal Executive has recorded its gratitude to Reg Macey for his contribution to the Institute as Business Manager since August 1982, and wishes him a speedy recovery.

David Wardlaw **VK3ADW**
Federal President

Matching Impedance Formula

Dudley Stalker VK3KJ
62 Hart Street, Colac, Vic. 3250

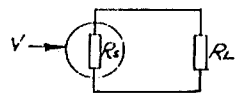
The emphasis on matching of impedances, (transmitter to line, line to antenna), in modern times, has come mainly because of the need to protect expensive output transistors by achieving low SWR.

A fundamental principle, that maximum power in a load coincides with source and load impedance equality, has tended to become obscured.

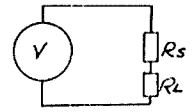
Since the principle is not immediately obvious, recourse to mathematical analysis is required for its proof.

In the following:

V is a voltage source
R_s is the source resistance
R_L is the load resistance



Since, to any current in the above configuration the source and load resistance are in series, we can imagine the source as being of zero resistance, and replace its resistance with an equivalent external resistance.



The voltage across R_L is given by the voltage divider principle as

$$\frac{VR_L}{R_s + R_L}$$

where V is the supply voltage.

R_s is constant, and we may take V as unity. So the voltage across R_L may be written as

$$\frac{R_L}{R_s + R_L}.$$

The power in R_L is given by the usual V^2/R, which in this case becomes

$$\left(\frac{R_L}{R_s + R_L}\right)^2 \Big/ R_L$$

$$\frac{R_L}{(R_s + R_L)^2}$$

$$\frac{R_L}{R_s^2 + 2R_sR_L + R_L^2}$$

To obtain a maximum for this expression, we differentiate it with respect to R_L and equate the resulting expression to zero.

$$\frac{d_p}{dR_L} = \frac{(R_s^2 + 2R_sR_L + R_L^2) - R_L\ (2R_s + 2R_L)}{(R_s^2 + 2R_sR_L + R_L^2)^2}$$

To equate this to zero, it is sufficient to equate the numerator to zero.

This gives:

$$R_s^2 + 2R_sR_L + R_L^2 - 2R_sR_L - 2R_L^2 = 0$$

From which $R_s^2 - R_L^2 = 0$
From which $R_s - R_L = 0$
From which $R_s = R_L = 0$

The maximum power in R_L therefore occurs when R_s and R_L are equal.

We could, of course, write Z for R in the above working to give a more general expression.

DEPARTMENT OF COMMUNICATIONS

P.O. BOX 34
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TELEPHONE: 64 1177
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REFERENCE: 86/1933

Mr E Russel
Federal Secretary
Wireless Institute of Australia
PO Box 300
CAULFIELD SOUTH VIC 3162

Dear Mr Russel

I refer to discussions at the Department[al/Institute] federal executive meeting, held on 19 August 1986, concerning packet radio, repeater cross-linking and other matters.

At the outset I would like to congratulate the Institute on its packet radio and repeater cross-linking submissions. The papers greatly assisted the Department in its consideration of these two new amateur operating concepts for amateurs in Australia.

I am pleased to advise that, from the date of this letter, both "packet radio" and repeater cross-linking is permitted in the Amateur Service. Operation is, however, subject to the conditions detailed in attachments (A) and (B). These conditions will be included in the revised amateur handbook which, as you are aware, is to now be produced as three separate brochures.

Additionally, noting the similarity between packet radio and RTTY, I would advise that use of unattended operation and store/forward techniques employing RTTY is authorised. Stations utilising these modes of operation must, however, conform to the conditions outlined for packet radio in attachment A.

Recognising that version "V2" of the Vancouver packet protocol can not meet the identification requirements stipulated until an updated version is released, the Department is prepared to authorise use of "V2" until 31 March 1987. It is anticipated that version "V3" will be available by this time and it is understood that "V3" will fully comply with the identification requirements.

The Department will authorise the cross-linking of up to three repeater stations. Cross-linking of any number of repeaters for the purposes of WICEN or approved WIA broadcasts will, however, be considered. Each link transmitter must be separately licenced and a fee of $26 per transmitter will apply. Applications to cross-link repeater stations should be forwarded to the relevant State Manager together with comment from the local WIA Division and the repeater licensees.

In relation to the topic of 29 MHz FM repeaters, I am pleased to confirm that the Department will permit this form of operation. The use of 16K0F3E by amateur and amateur repeater stations operating in this band is also authorised. The Department would now be pleased to consider WIA band plan arrangements for repeater operation in the 29 MHz amateur band.

Your assistance to promulgate the information outlined to the amateur fraternity, through the normal channels available to the Institute, would be appreciated. Should you require any additional information in relation to these matters, you should contact Mr W Huxley (telephone (062) 644991) who would be pleased to assist you further.

Yours sincerely

D HUNT
Manager Regulatory
Operations Branch
Radio Frequency Division
CANBERRA
30/9/86

Attachment A

PACKET RADIO

GENERAL CONDITIONS

(1) Novice Amateur Stations shall not use the packet radio transmission mode of operation.

(2) Amateur stations utilising "packet radio" must conform to the general technical parameters and conditions applying to the Amateur Service.

(3) Each "packet" shall contain the originating stations identification, that of the destination station and the station transmitting (if different from the originating station).

(4) Amateur stations employing "packet" in an unattended operating configuration shall be fitted with:

(i) a timer to cause automatic shut-down of the station transmitter after 10 minutes of uninterrupted transmission.

(ii) a fail-safe facility to prevent the station transmitter operating due to equipment malfunction.

(5) An amateur station shall not retransmit a "packet" signal in any amateur band that the originating station is not authorised to use.

(6) Amateur stations when utilising the packet radio transmission mode shall not be connected to the switched telephone network.

IMPORTANT NOTES

(A) Any protocol may be used for "packet" transmission provided it meets the identification requirements stipulated in (3) above.

(B) The use of store/forward packet techniques by stations in the Amateur Service is permitted.

(C) Amateur licensees employing the packet radio mode of transmission are reminded that they are responsible for ensuring that third party traffic conditions are met. This point is especially important to note if using store/forward "packet" techniques on amateur bands below 30 MHz.

(D) Providing the conditions stipulated in (4) above are met, amateur stations may operate in an unattended configuration when utilising the packet radio transmission mode.

(E) Packet repeater stations must comply with the conditions applicable to repeater stations and those conditions outlined above.

Attachment B

REPEATER CROSS-LINKING

GENERAL CONDITIONS

(1) Repeater "cross-linking" arrangements must conform to the general technical parameters and conditions applying to the Amateur Service.

(2) The repeater "link" shall not be used to permit an amateur station to be retransmitted in a band it is not authorised to use.

(3) Each "link" transmitter shall be fitted with:

(i) a fail-safe device to prevent operation due to any malfunction.

(ii) a timer to cause automatic shut-down after 10 minutes of uninterrupted transmission.

(iii) a facility to, when activated, transmit an identification call sign at least once every 10 minutes.

(4) Repeater stations shall not retransmit the call sign of the "linked" station or that of the "link".

(5) The link transmitters shall only be activated, for other than identification purposes, when a received signal is present on any of the "linked" repeater stations.

IMPORTANT NOTES

(A) Cross-linking of up to three repeaters will be authorised.

(B) The conditions outlined in 1 - 5 above also apply to single repeater stations, with split transmitting and receiving sites, which utilise links.

(C) Only frequencies above 50 MHz will be authorised for the cross-links.

(D) Applications to cross-link repeater stations should be forwarded to the State Manager for approval.

(E) Each link transmitter may utilise the call sign of the station at which it is situated for the purposes of identification.

30/9/86

A MULTIBAND END-FED INVERTED-VEE AERIAL SYSTEM

Written by Colin Dickman ZS6U

Reprinted from RADIO ZS, August 1977 and contributed to AR by James Crichton VK2XFC

The following article was originally printed in *Radio ZS*, January 1973, but was reprinted in August 1977 in response to popular requests by readers. It has been contributed to AR by James Crichton VK2XFC.

It is not without good reason that end-fed aerials requiring tuners have fallen from favour to be replaced by systems using untuned transmission lines. Our transmitters and linears have enough knobs without adding an extra three or four to twiddle.

Yet, by a judicious choice of wire length we can produce a situation where the simplest of preset tuners can be used with them resulting in a compact, cheap, easily constructed multiband aerial system with certain advantages over the commonly used multiband aerials.

Suspecting that, lying in obscurity amongst the many pieces at the bottom of the hat there were two which in partnership would emerge as a team deserving of a share of limelight, I delved until out came the pair presented in this article.

CHOOSING THE TUNER

A tuner is a coupling network between the low impedance output of the transmitter (Zot) and the impedance of the input to the antenna (Zia). It must perform one or both of the following:

(a) act as an impedance matching transformer
(b) resonate the aerial system by cancelling any reactance present in Zia.

If Zia is complex, containing widely different amounts of reactance and resistance on each band, a complex tuner is required to cope with it. The less complex Zia, the simpler the tuner. In fact, if we can arrange to keep Zia always greater than Zot we can use L-networks of the step-up variety as depicted in Figure 1, requiring only two adjustments for each band. Both networks will perform the same function but only 1A is capable of suppressing harmonics so this is our obvious choice.

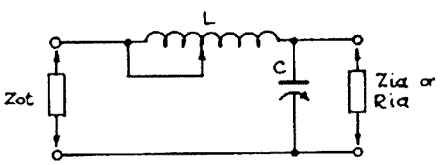


Figure 1a — Low-Pass.

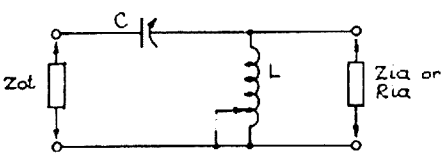


Figure 1b — High-Pass.

CHOOSING THE AERIAL LENGTH

Figure 2, depicts the input characteristics of an

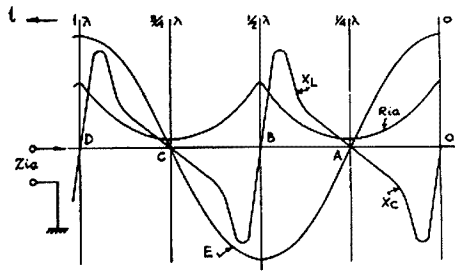


Figure 2.

end fed aerial showing how the reactance, resistance and the voltage change as the length is varied from 0 to 1 wavelength. The figure applies equally well if the wire length remains constant and the input frequency is varied, and can be extended indefinitely to the left for lengths exceeding one wavelength.

a) Random Lengths

If the length of the aerial falls between the points O, A, B, C, D the input impedance Zia contains reactance as well as resistance either of which may be high or low depending on the length and the frequency. Clearly, Zia may be low on one band and high on another. Furthermore, the reactance may be capacitive (negative) on one band and inductive (positive) on another, resulting in severe detuning of the tuner's natural resonance in order to provide the required reactance of the opposite sign. Apart from the fact that at least three variable elements are required in the tuner; eg a pi-network, the range of minimum to maximum inductance and capacitance must be large and tuning difficulties are likely at the lowest and highest frequencies. So much for random lengths!

b) Resonant Lengths

OA, OB, OC, OD are all resonant lengths inasmuch as the reactance is zero and Zia becomes a pure resistance which we shall call Ria. For OA and OC, Ria is very low and these lengths lend themselves only to odd-harmonic operation. On the other hand, lengths OB and OD, which are multiples of a half wavelength, are suitable for all harmonics and Ria is a high resistance on all bands. Just what we need for our L-network.

From this, we could choose a half wavelength on 80 metres which would be two halfwaves on 40, four on 20, six on 15 and eight on 10. But, by making our length a quarter-wave on 80 we can make our aerial half as long and since Ria will be in the same order as Zot on 80 metres, we can arrange the switching in our L-network so that the aerial bypasses the network direct to the transmitter on that band.

The length formula for an end-fed aerial is:

$$\text{Length} = \frac{149.95\,(n - 0.025)}{f\,(\text{MHz})} \text{ metres}$$

where n = number of half wavelengths.

The length we require is one which will accommodate four halfwaves on 10 metres. Taking f = 28.5 MHz then length = 149.95 (4 - .025)/28.5 = 20.91 metres. Although the wire will be a few percent too long at the lower frequencies, the reactance introduced is small enough to be cancelled by the tuner without serious detuning effects.

Having made a prudent choice of tuner and wire length, let us proceed to a practical design of this happy partnership.

DESIGNING THE L-NETWORK

The behaviour of an end-fed harmonic aerial is best understood in terms of transmission line theory. Any single wire parallel to ground forms a transmission line against ground with a characteristic impedance Zo = 138 log 2h/r where h = height of the wire above ground and r = radius of the conductor in the same units. Typically, for a wire radius of 0.8 mm and an antenna height of 7.62 metres, Zo = 607 ohms.

Such a transmission line, although physically open circuit at the far end, is in effect terminated by the equivalent of a resistance related to the power lost from the wire by radiation. As with all transmission lines, this fictitious resistance reduces as the line is lengthened in terms of wavelength and approaches infinity. For any line, this resistance is repeated at the input end and is in fact our previously mentioned Ria. Measured with a bridge, the input resistance that can be expected is shown in Table 1.

TABLE 1.

LENGTH OF WIRE WAVELENGTHS	RIA OHMS
0.25	60
0.5	2 800
1	1 700
1.5	1 200
2	900
3	750
4	700

Figure 1a depicts the basic circuit of the L-network when matched between the output load impedance of the transmitter (Zot) and the input resistance of the aerial wire (Ria). When Ria is vary much greater than Zot, the equations for the circuit simplify to:

$$2\,fL = \sqrt{\text{Ria} \times \text{Zot}}$$

and

$$\frac{1}{2\,fc} = \sqrt{\text{Ria} \times \text{Zot}}$$

with which we find that inductance and capacitance to use in our tuner on each band. Select the value for Zot arbitrarily as 52 ohms and find the value of Ria from Table 1. A typical set of results is shown in Table 2. It should be borne in mind that these results may be modified in practice by:

a) stray capacitances and inductances in the tuner
b) reactance at the aerial input.

After constructing the L-network, the actual value of Zot may not be 52 ohms as planned but somewhere between 35 and 75 ohms. This is of no consequence as the loading control of the transmitter is quite capable of matching any pure resistance over such a range.

CONSTRUCTING THE L-NETWORK

Figure 3 gives the inductor dimensions and

TABLE 2.

FREQ MHz	RIA OHMS	XL or Xo OHMS	L μH	C pF
3.7	60	0	0	0
7.075	2 800	380	8.6	60
14.2	1 700	297	3.3	38
21.3	1 200	250	1.8	31
28.6	900	216	1.2	26

layout of a practical L-network for the 20.91 metre aerial. The values given for L in Table 2 have been translated into turns. Figure 4 is the circuit diagram. The RF choke is included to prevent static charges building up on the antenna wire during storms. Its reactance at the lowest frequency is about 20 times higher than the Low-Z input so it introduces no measurable loss. The switch is arranged to short out all but the required number of turns on 10, 15 and 20 metres. No connection is made to the 40 metre switch contact so that, on this band, the full coil is operative. In the 80 metre position the whole coil is shorted out to provide the direct connection as described previously.

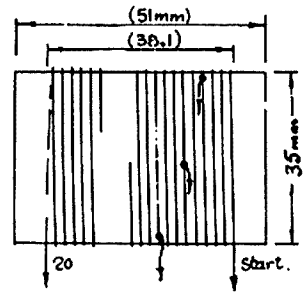


Figure 3.

5½	TPCM
TURNS	**BAND**
20	40
8	20
5¼	15
3½	10
Wire	0.9mm

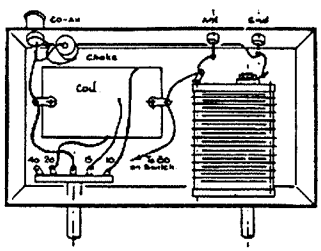


Figure 4.

The tuning capacitor has the highest voltage across it on the 40 metre band where Ria is 2 800 ohms. Using the equation Epk = 1.4 √ WR it can be seen that the capacitor must withstand a peak voltage of about 1 500 volts when the transmitter output power is 400 watts. A 0.5 mm spacing between plates is adequate, and the small capacitance permits the use of small physical size. A straight-line-wavelength type is preferable to one with circular plates as it allows greater separation between the higher frequency settings.

The whole unit was built into a plastic box measuring 127 x 77 x 51 mm. There is no need to use a metal box, but if one is used, the coil should clear the metal by at least 25 mm on all sides.

PUTTING UP THE AERIAL

The size of wire is not critical, about 1.2 mm diameter being typical. As a portion of the wire will be in the shack it is advisable to use an insulated variety. The conductor may be solid or stranded.

Take a length of wire in excess of 21 metres, and attach an aerial insulator. Anchor to some suitable point and stretch the wire a little. Accurately measure off 20.91 metres and cut.

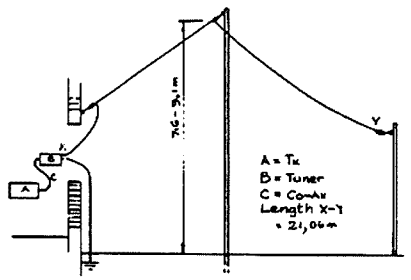


Figure 5.
A = Transmitter
B = Tuner
C = Coaxial Cable
Length X - Y = 21.06 metres

A typical installation is shown in Figure 5. Although the aerial will load and perform well in almost any configuration, I have taken the advantage of the true inverted-Vee configuration (as distinct from the drooping dipole). Reference to long wire aerials in the usual literature will show that on 10 metres this configuration, also known as a "half Rhombic," can provide low-angle, vertically polarised, end-fire radiation with a gain of some 6 dB over a ground plane antenna. The aerial tends to become more omnidirectional as the frequency is lowered but radiation on all bands tends to be greater in the direction of the free end of the wire. Even on 80 metres this diminutive aerial performs as well as a 40.23 metre length dipole at the same virtual height, provided you have an effective ground system, but of course, there is nothing to stop you from making a double size ZS6U special using the information given to modify the inductor capacitor and switching accordingly. A pole is often unnecessary if you can find something higher than your antenna, such as a chimney, to hold up the apex with nylon cord. This type of support may result in a sloping plane for the Vee, which is no disadvantage.

BEAMING TO DX

As an alternative to the inverted Vee, — if you are keen to beam your signal on 20 and 15 as well as 10, use an upward sloping configuration at an angle of about 30 degrees to the horizontal towards the desired direction. Or if you live in an apartment several storeys above ground, you can use a downward slope. For field days and temporary installations take your "box" and 21 metres of wire with you.

SECURING THE AERIAL

At the shack end of the aerial you will need an anchor to take the strain. Use nylon cord with an egg insulator, securing the wire to the latter before the last few metres drop into the shack through an air-brick, ventilator or whichever entry point you consider best. The L-network should stand close to the entry point and the transmitter should be close to the L- network so that as little coax as possible may be used to couple between the two. A length of about 600 mm is typical.

CALIBRATING THE L-NETWORK

There is only one way to positively calibrate your L-network so that it presents a pure resistance to your transmitter, and that is by means of an SWR bridge of the appropriate impedance inserted in the short piece of coax. Switch to the 40 metre band and roughly set the capacitor by peaking up on reception. Switch the SWR bridge to the reflected power position, provide a small carrier and rotate the L-network capacitor to give a minimum reflected reading. Leave it there while you load up your transmitter to full power. Now check for the minimum again and mark the scale. Repeat the procedure for 20, 15 and 10 metres. Finally, set the capacitor to minimum and switch the network to 80 metres. If it will not fully load the transmitter you have an ineffective earth system on 80 and it is time you did something about it anyway!

BAND-CHANGING

You are all set. To change bands simply switch to the band required and set the capacitor to the mark, remembering that the mark for 80 is at minimum capacitance. Once set, the tuner will provide the correct load for your transmitter tune-up and it should not be fiddled with. The SWR you measured might have been anything from 1:1 (meaning your pure resistance was the same as the bridge) to 2:1 (meaning it was either half or double the bridge resistance). No matter what the reading, ignore it if your rig loaded up nicely. However, if you have one of those rigs without a loading control, designed optimistically to work only into a 52 ohm resistive load, you might have to move the taps until you have a 1:1 ratio on a 52 ohm bridge on all bands. If you borrowed the bridge you can now return it to the owner.

CONCLUSION

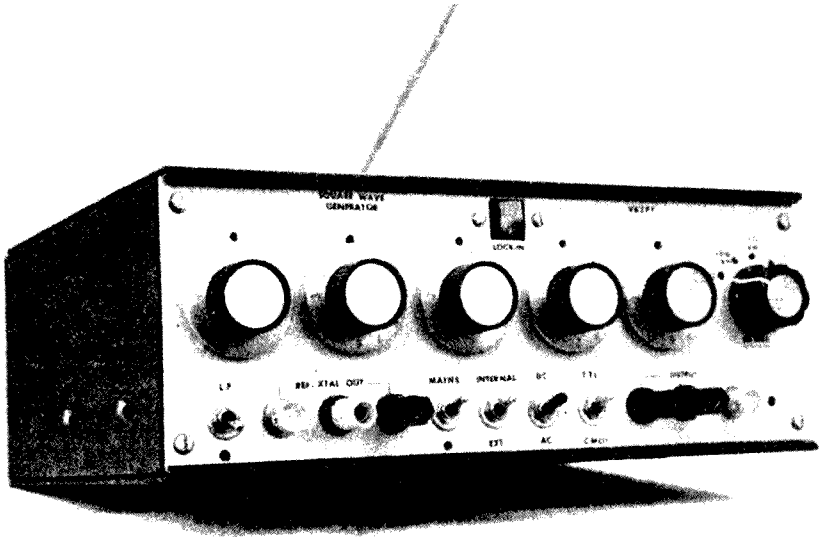
At the start, I hinted that this system has certain advantages, several of which have so far emerged in the text, such as a purely resistive load and no transmission line matching problems and losses. Obviously the aerial is cheap, is smaller than other aerials that include 80 metres and is an effective harmonic suppressor. Less obvious are the advantages in reception where not only does the system provide additional front end selectivity, but sensitivity as well. The latter derives from the fact that the effective capture area of the antenna remains fairly constant over its range whereas that of a trap dipole or vertical reduces in proportion to the square of the wavelength. This accounts for the lively receiver performance, particularly at the higher frequencies. RF in the shack? As reactance is absent, a field strength meter will show no greater stray RF than with conventional antennas. This goes for BCI too.

I can take no credit for the well worn principles expounded here. But I hope that pulling my selected pair out of the hat will provide a popular alternative multibander for the greater enjoyment of our hobby.

Next month we will present a follow up article. The following article will provide a summary of this months article and will also expand some of the details.

A SQUARE WAVE GENERATOR
Part One

Ken Kimberley VK2PY
21 Nicoll Street, Lakemba, NSW. 2195



The generator about to be described uses the Phased Locked Loop (PLL) principle.

By definition and modern day vernacular, it should be called a *synthesiser* however, in the writer's opinion, this term is another of those horrible *Americanisms* which are creeping into our language, and therefore should be avoided where possible! There is certainly nothing synthetic about its performance.

This unit was originally developed having a basic frequency resolution of 1 kHz. With this configuration, the top reliable operating frequency was in the region of 3 MHz; ie 2.999 MHz.

Above here, "Lock" time increased and a small glitch of one digit appeared if and when the last two switches were set on 00. Notwithstanding, the prototype managed to stagger up to 3,800 MHz. The absolute limit being determined by the characteristic spread of the semiconductors and stray circuit capacitance.

The next version, MK II had its resolution improved by a factor of 10, enabling the output to be settable to 100 hertz resolution. This modification needed only two extra divider chips (4017) and a rotary switch, together with a little wiring around the switch, summing gate and VCO.

The reference frequency now being 50 hertz also necessitated an increase in the loop filter time constants.

Now *Murphy* dictates that "nothing can be gained for free" (not even lunches!) and that every improvement tends to introduce some adverse reaction, however slight. The main one in this case was an increase in "Lock" time. This was acceptable up to 1.9999 MHz and usable to 2.5000 MHz where our old friend, the glitch, was still evident. It is surmised that this spurious is due to timing problems in the 74C30.

At this stage, the problem has been ignored and the frequency limits re- specified as 2.999 MHz (MK I), and 2.5000 MHz for the later version. Maybe, at a later date, a second 74C30 will be tried, or the board re-wired to take a 4068 hex NAND gate, which is more readily available.

CHIP TYPE 4046

The brain of this instrument is a CMOS IC, type 4046, which contains a zener diode, RC type VCO, two phase detectors and a source follower. However, only the VCO and one comparator are used in this design.

PLL EXPLANATION

Before proceeding with the circuit description, a brief outline of this PLL system will be given.

Two divided down signals are presented to pins 3 and 14 of the 4046. One is derived from the reference source, and the other from the VCO output via the programmable divider.

These frequencies, if different, will produce a DC error signal from the comparator which, in

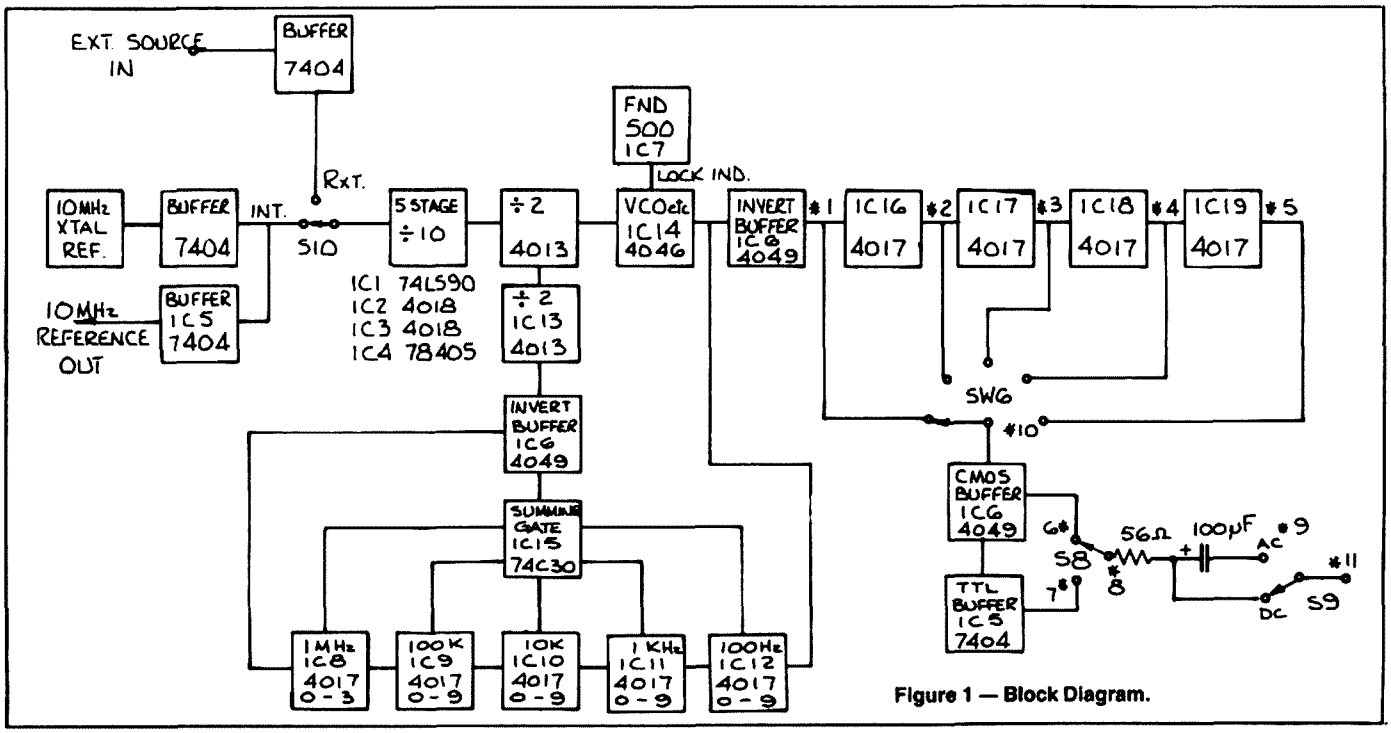


Figure 1 — Block Diagram.

turn, is fed to the VCO causing its frequency to be shifted until it locks with that of the reference.

Perhaps a practical example will make the foregoing a little clearer. Let the desired output be 1.5 MHz, therefore set the program switches to 15000. The following now takes place — Output from pin 4 of the VCO is divided by 15000 in the 4017s numbered IC8 through to IC12. The resultant is then fed, via the summing gate (IC15) 74C30, to one half of the dual "flip flop" 4013 (IC13), where a further division (2) takes place, and thence to pin 3 of the comparator. The other input (pin 14) is derived from the 10 MHz source and is supplied at 50 hertz.

The almost instantaneous reaction is tor the comparator to produce an error signal which, being applied to the VCO, shifts its frequency until the signals on pins 3 and 14 are identical in frequency and phase. Therefore, the signal at pin 4 must be 30 000 times 50 Hz, or in other words, 1.5000 MHz.

Similarly, changing the program to 01000 gives a total division of 2000 resulting in a locked frequency of 100.000 kHz.

As the VCO is locked to the divided-down reference, the stability and accuracy of the two must be similar. However, a little phase noise is normally present at the VCO output. How much is dependent upon the basic VCO stability and the time constant of the "Low Pass" filter in the error signal path, and is of little consequence in this application.

GENERAL CIRCUIT DESCRIPTION

It will be easier to follow this description if reference is made to the block diagram, Figure 1.

Whilst the 4046 was said to be the brain of this circuit, the heart must certainly be the reference oscillator, for this controls the overall stability, etc. There are several ways to go in this direction, some of the alternatives being dealt with below. The final choice is governed by one's personal preference, the intended use and/or cost.

Let's look at some of them.

1. THE ULTIMATE

The constructor may choose the "Ovened Reference", which was described in an earlier paper [1]. It could be built in and a buffered output provided so that the highly stable 10 MHz source would be available for external use. This design is technically superior, but it's cost may not be justified.

2. EXCELLENT

The choice here is to build the generator minus oscillator and feed it externally from a "free-standing" ovened reference oscillator. The results will be as per Reference 1. Cost will be greater due to the duplication of power supplies, cabinets etc. Convenience would suffer a little, due to the extra connecting cables etc.

3. VERY GOOD

Forget the temperature control bit altogether and build a straight *Colpitts* oscillator using two transistors, *Darlington* configured. This design is cognisant of cost, whilst maintaining performance. It is considered that this procedure would be more than adequate for most amateurs.

4. SATISFACTORY

A gate-type crystal oscillator would perform adequately here and be quite economical as well. Suitable crystals are regularly advertised in the local magazines. Lower frequency crystals (4.000 MHz) are available and could prove very useful. One of these would enable the use of a CMOS device instead of a TTL and eliminate the level converter TR1.

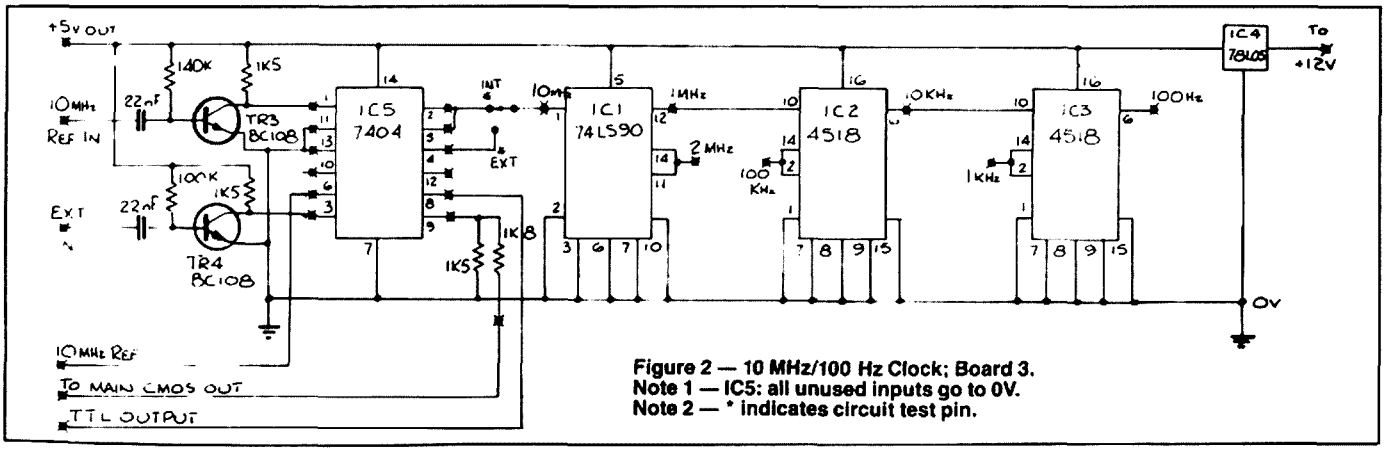


Figure 2 — 10 MHz/100 Hz Clock; Board 3.
Note 1 — IC5: all unused inputs go to 0V.
Note 2 — * indicates circuit test pin.

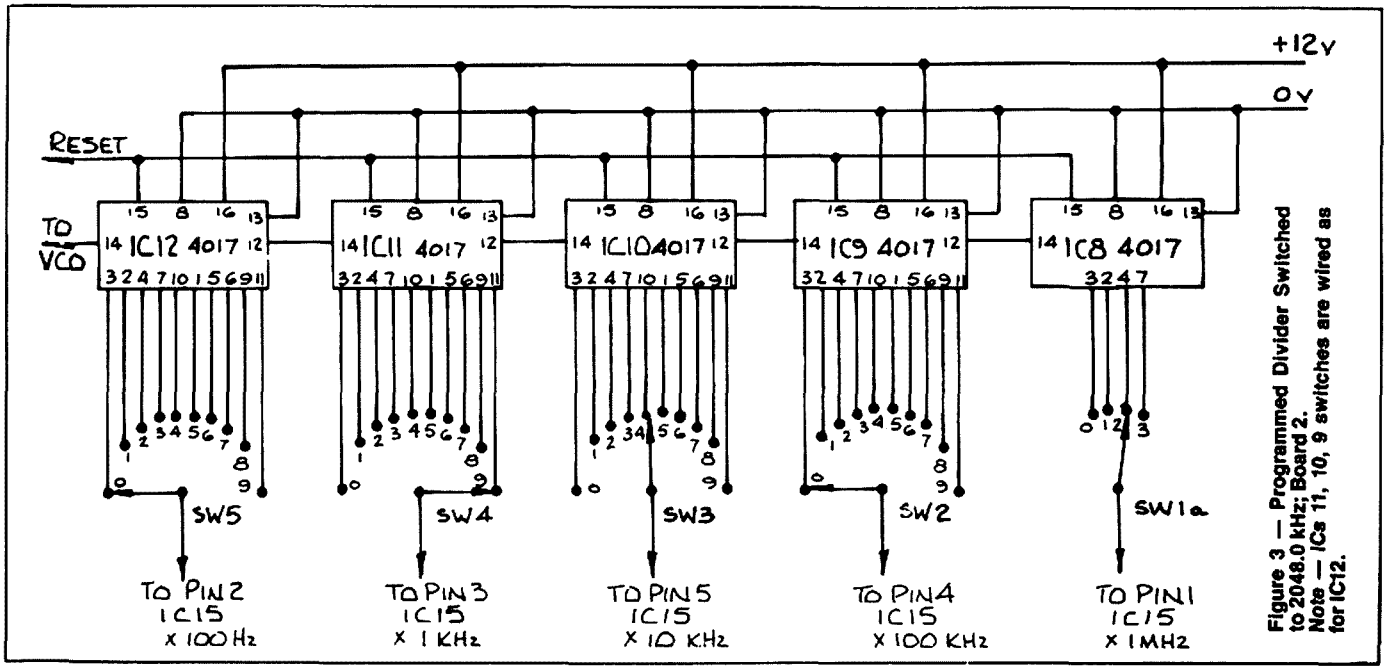


Figure 3 — Programmed Divider Switched to 2048.0 kHz; Board 2.
Note — ICs 11, 10, 9 switches are wired as for IC12.

Well readers, the choice is yours, you pay your money and get only what you pay for. Fortunately, the constructional method employed will permit a change from one to another alternative quite readily.

The author elected to use choice number one, mainly because of having already gone through the exercise of developing an "ovened oscillator." (See previous article). Hence, the remaining description is biased in this direction.

CLOCK DIVIDER

The buffered output from the reference goes, via IC5 (part 7404), to the five stage decade divider (IC1 74LS90, IC2 4518 and IC3 4518) through the internal/external switch. (See Figure 2). Thus the 10 MHz reference has become 100 Hz at 5V CMOS levels.

PROGRAMMABLE DIVIDER

Attention must now be directed to the programmable divider (see Figure 3).

This is driven from pin 4 of the 4046 (IC14). It consists of five pre-settable counters type 4017 (IC6 through to IC12) all cascaded together and controlled by five non-shorting rotary switches wired to the appropriate divider pin connectors.

SUMMING GATE

The wipers of these switches are then directed to five inputs of a Hex NAND gate (IC15 74C30), and the unused gates are held high by a 3.9 kohm resistor connected to +12 volts (See Figure 3). The output pulse is taken from pin 8 and is then presented to pin 14 (IC6 4049) of the inverting buffer. The output from pin 15 is shunted in two directions, firstly to the reset inputs of the 4017s (pin 15) and secondly to the 4013 flip flop (pin 3).

DIVIDE BY TWO

The 4013 is used to convert the asymmetrical output of the programmable divider into a square wave signal with a mark space ratio of 1:1, being divided by two at the same time. When locked, the frequency at pin 1 (IC13) will be 50 Hz (see Figure 4).

Naturally, the reference signal must also be 50 Hz, and this is taken care of by the other half of the 4013 flip flop. TR1 converts the TTL level to 12 volts CMOS so that the IC13 may be toggled.

We now have two 50 Hz signals processed and ready for the phase comparator. This section was discussed adequately in the early part of this dissertation, hence the point will not be laboured further, except to mention the lock indicator. Pin 1 of IC14 goes high in acquisition of lock, which turns TR2 hard on. The appropriate LEDs in the FND 500 display (IC7) are driven from the emitter via three current sharing resistors. The current is set at 10 mA per segment.

OUTPUT OPTIONS

A decision should now be made regarding the output options to be incorporated into the unit. (Refer Figure 1). There are many available, of which the constructor may choose any combination of those listed below:

1 Basic Range; ie frequency range from 2.5000 MHz down to 100 Hz. This is available from circuit "Test Pin" number *1.
2 259.99 kHz down to 10 Hz at pin *2.
3 25.999 kHz down to 1 Hz at pin *3.
4 2.5999 kHz down to 0.1 Hz at pin *4.
5 259.99 Hz down to 0.01 Hz at pin *5.
6 Option 1 through to 5 available at pin *10.
7 CMOS level *only* at pin *6.
8 TTL level *only* at pin *7.
9 CMOS/TTL switchable at pin *8.
10 DC coupled at pins *6, *7, *8, and *10.
11 AC coupled at pin *9.
12 AC/DC coupled at pin *11.

Options 2, 3, 4, 5, and 6 require the use of a down range extender.

DOWN RANGE EXTENDER

This section (refer Figure 5), consists of up to four decade counters (IC16 through to IC19) and are all type 4017. The exact number required depends on the range extension required.

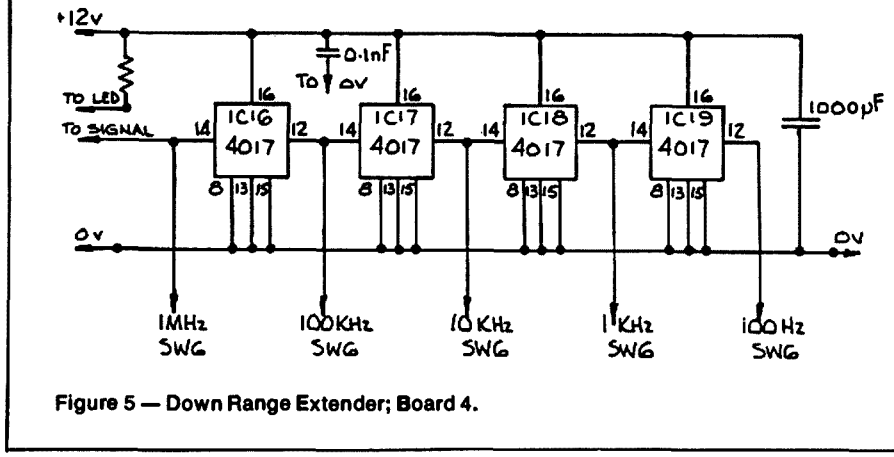


Figure 5 — Down Range Extender; Board 4.

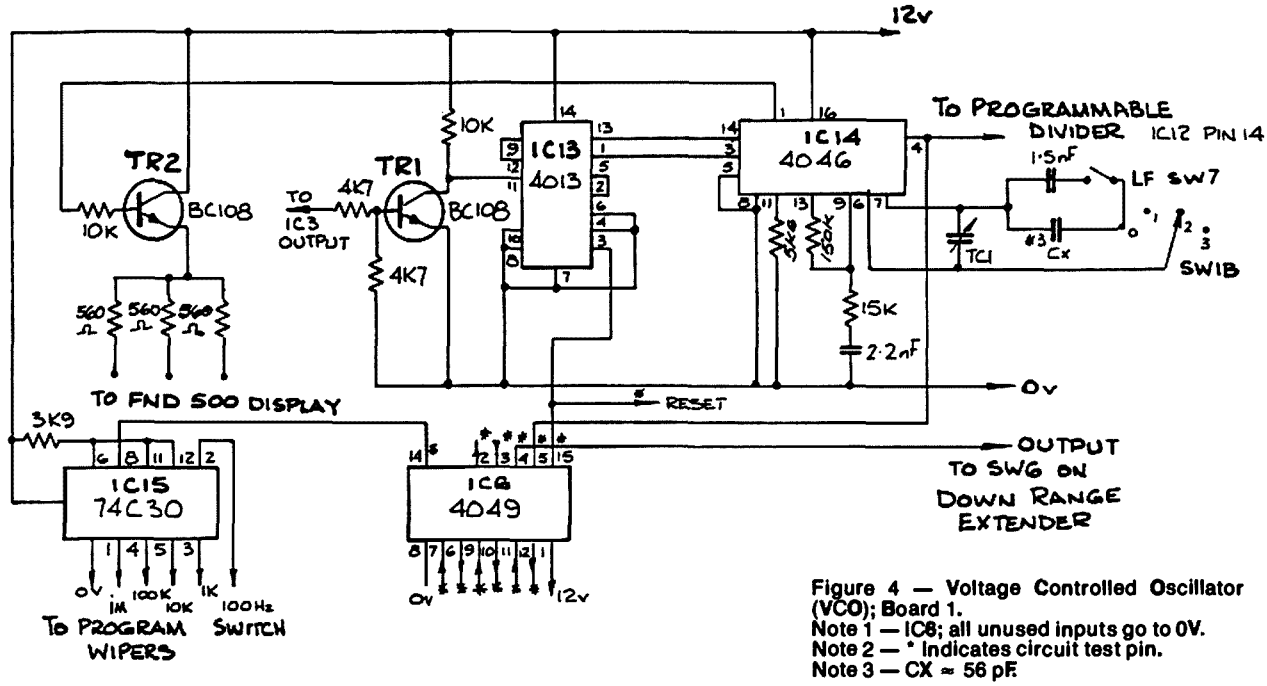


Figure 4 — Voltage Controlled Oscillator (VCO); Board 1.
Note 1 — IC6; all unused inputs go to 0V.
Note 2 — * Indicates circuit test pin.
Note 3 — CX ≈ 56 pF.

If an asymmetrical output wave form is considered satisfactory, then two chips may be saved by using two only 4518 duals in lieu of the 4017s.

However, the author recommends the 4017s, and strongly suggests the fitting and wiring of all four sockets. This, plus the relevant pins, makes it a simple matter to add extra options at a later date.

Stability is assisted by the use of high values of C in the feedback path, thus reducing to a minimum, frequency shifts caused by the reaction of transistor and power supply variations, etc.

The signal is lightly coupled into TR7 which provides high gain and buffering, thence to TR8 for shaping to drive Board Three.

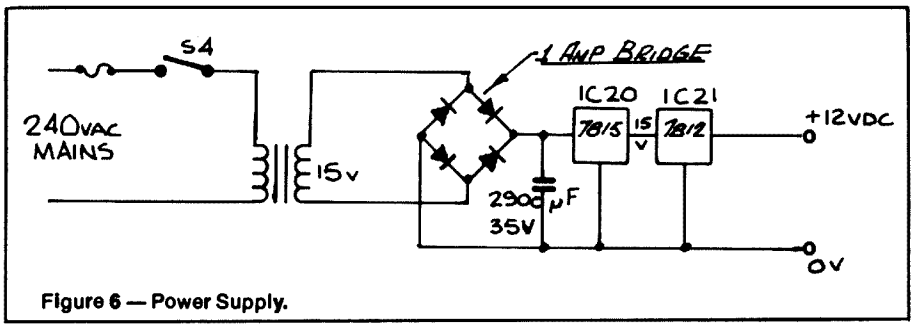


Figure 6 — Power Supply.

References: 1. 10 MHz Temperature Controlled Oscillator, AR, September and October 1986

SPECIFICATIONS

FREQUENCY RANGE AND RESOLUTION

MHz	100 Hz-2.5000 MHz in 100 Hz steps.
100 kHz	10 Hz-250.00 kHz in 10 kHz steps.
10 kHz	1 Hz-25.000 kHz in 1 Hz steps.
1 kHz	0.1 Hz-2.5000 kHz in 0.1 Hz steps.
100 Hz	0.01 Hz-250.00 Hz in 0.01 Hz steps.

OUTPUT

Switchable from TTL to 12 volts CMOS levels. Switchable from DC to AC coupled.

FREQUENCY STABILITY

Dependent on crystal oscillator used. Can be better than 0.01 PPM (per day) if using the ovened option, whilst a simple gate type will provide stabilities in the order of a few parts per million.

This completes the description of the theory of operation and the circuit of the generator. Part two of this article will describe the construction and testing of the complete unit.

To be continued . . .

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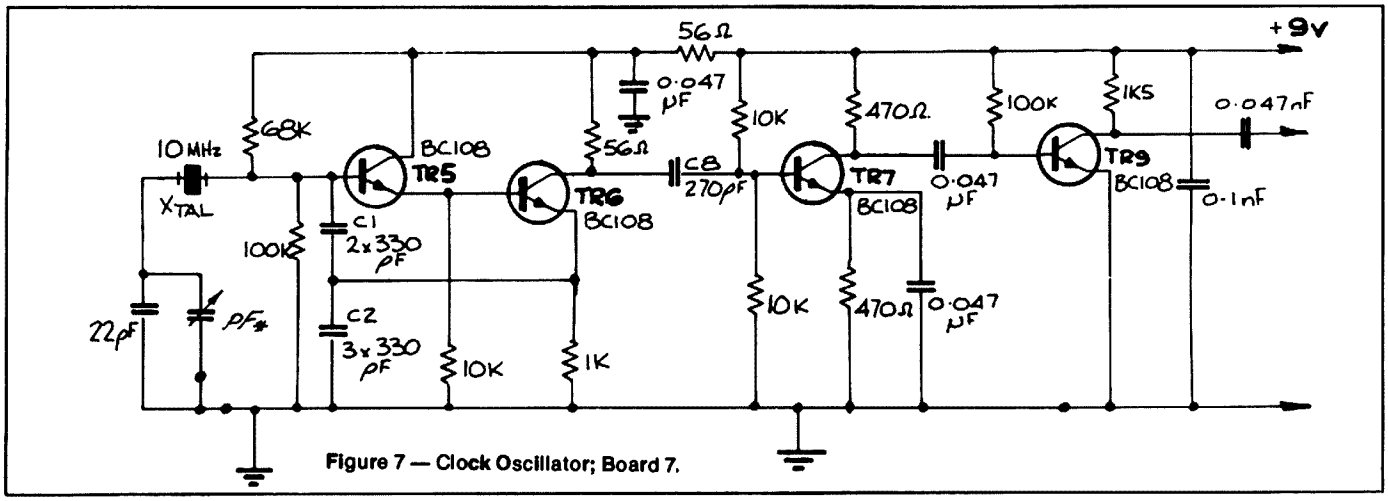

Figure 7 — Clock Oscillator; Board 7.

POWER SUPPLY

This is a comparatively simple circuit (see Figure 6), and follows convention. 240 volts "mains" supply is fed via a fuse and SPST toggle switch to a 240/15 volt power transformer (Catalogue No M2155).

Output from the 15 volt secondary is fed to a one amp bridge rectifier. Adequate filtering is provided by a 3000 uF can-type electrolytic capacitor.

Two voltage regulators are used, connected in series. The 15 volt source is derived from IC20 (7815) and the 12 volt from IC21 (7812). The two were connected in this way to improve the 12 volt regulation.

CRYSTAL CLOCK OSCILLATOR

This will be a 10 MHz crystal oscillator of some description. For those of you who have not read my previous article on crystal oscillators, or who choose to use an unovened oscillator, a brief description of a suitable type will be presented here. In fact, the unit was initially built, set up and tested using such a clock. This board is designated as number five and is built onto a "Plug-in IC Board" Catalogue No H5610. Refer Figure 7 for the circuit diagram.

It uses four type BC108s, or similar, transistors. TR5 and TR6 are used for the oscillator proper. Darlington configuration is used as better stability is obtainable with this circuit.

FLORENCE McKENZIE MEMORIAL TROPHY

Mavis and Ivor Stafford VK3KS and VK3XB
16 Byron Street, Box Hill South, Vic. 3128

In October 1983, an article,* Hamming it up on the Airwaves, *written by Jo Wiles, appeared in the magazine* New Idea. *This was a story arising from interviews with Margaret VK3DML, Mavis VK3KS and Kim VK3CYL, who had narrated to Jo their experiences in amateur radio.

So appealing did Jo make this article that some 40 interested ladies wrote to the Secretary of ALARA, Jenny Warrington VK5ANW, requesting further information as to how they could also take up the hobby. Jill Keals adopted a different course, approaching the proprietor of a radio shop in Nambour, Queensland. She was directed to inquire from a local amateur who in turn suggested that she should contact Wendy Davies VK4BSQ. This was done. Wendy offered to coach Jill for the Novice Licence and in due course Jill obtained the call sign VK4VNK.

The ALARA Contest of 1984 featured for the first time the Florence McKenzie Memorial Trophy which had been presented to ALARA by the Townsville Amateur Radio Club and which was now offered as the Award to the Australian YL novice operator gaining the highest CW score in the Contest. Jill scored 162 points and was awarded the trophy.

As the trophy is large, and forwarding it would have been very expensive, it had been decided that a certificate nearing a photograph of the trophy would be sent instead. Jill nevertheless retains the honour of being the first Australian YL novice to win the trophy and to have her name engraved on it. Thanks to further coaching from Wendy, Jill is now VK4ASK.

In 1985, unfortunately no YL novice entered for the trophy, but it is hoped that the 1986 ALARA Contest which takes place on November 8, will see a number of Australian YL novice operators competing for this magnificent award. It will be on display in the Victorian Divisional Office.

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RTTY TEST GENERATOR

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This article describes a hardware based RTTY test generator which is capable of generating a number of pre-programmed fixed messages or a continuous stream of single characters. It can generate either ASCII or Baudot with a wide range of shifts and speeds.

INTRODUCTION

As described in a previous article, see *Amateur Radio* April 1986, I decided that I would like to be able to decode the many RTTY signals that can be heard across the HF bands.

In due course, a rather sophisticated, (an alternative description is over- complicated), decoder offering many options had been designed and was just about finished. At this point, the problem of testing it was considered. The obvious alternatives were to either use off-air signals with the attendant distortions, interference and doubt that it may not be a valid code anyway or to build a test generator that would produce a predictable output. The latter course was chosen.

CIRCUIT DESCRIPTION

The heart of the circuit is a Universal Asynchronous Receiver/Transmitter (UART for short). Only the transmitter portion is used here to convert from a parallel data input to a serial data stream output. The output data rate is determined by a variable frequency clock generator that drives the appropriate input on the UART.

The parallel data is generated either by a ROM or a group of up to eight switches. If the ROM is selected, a continuously repeating message of 64 characters is generated. This length was arbitrarily selected as being a convenient length that would contain "The quick brown fox, etc."

The ROM used is a 2716 which will store a maximum of 2048 characters. The data stored in the ROM can be arranged in a number ot ways; ie either as a large number of short messages or a small number of long messages up to the capacity limit of the ROM. In my case, I have chosen a message length of 64 characters which then allows me to have a total of 32 different messages. If the switches are selected instead of the ROM, a continuous stream of characters as defined by the switch setting will be sent. Since the data path is a total of eight bits wide both ASCII data (seven bits) or Baudot (five bits) can be easily handled. Also connected across the eight data lines to the UART is an octal buffer that drives eight LEDs. The LEDs allow the data input to the UART to be monitored.

The serial data stream from the UART drives the logic input of an XR2206 function generator IC. The logic level input causes either of two timing networks to be selected, so generating one of two tones, depending on the logic state at the time.

DETAILED CIRCUIT DESCRIPTION

1. The UART

The UART is a very versatile, widely used integrated circuit which provides a programmable interface between an asynchronous serial data channel and a parallel data channel.

The transmitter section converts parallel data into a serial word which includes start bit, data, parity bits (if selected) and stop bit/s. The receiver converts a serial data stream of the same format as that being transmitted into a parallel word whilst automatically checking start bit, parity (if selected) and stop bit/s.

In addition to the parallel data bus lines, a number of control and status lines are available to monitor the state of the circuit and control it.

All UARTs of the type used in the circuit to be described are functionally interchangeable although some features, such as power supply requirements, vary. Some of the UART programmable characteristics are as follows:

- It can operate full or half duplex, transmitting and receiving simultaneously at different Baud rates.
- The word length may be five, six, seven or eight bits; parity generation/checking may be odd, even or inhibited.

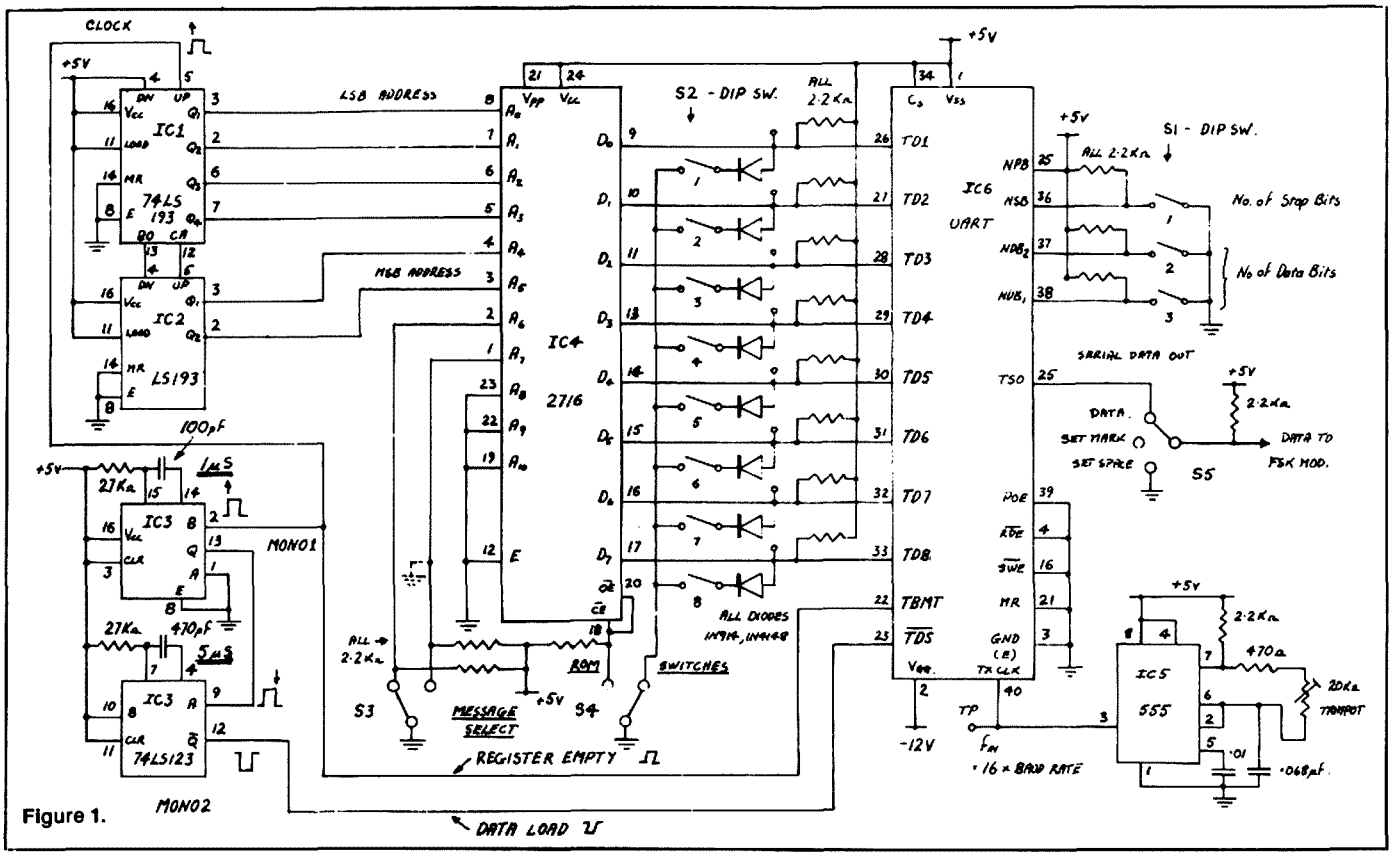

Figure 1.

• The number of stop bits may be either one or two with 1.5 bits automatically selected when transmitting five bit code.

The above description shows that the UART can form the basis of a versatile test generator that can generate a wide variety of serial data formats including the common five bit Baudot codes and seven bit ASCII, depending on the parallel data available.

2. Serial Data Generator

The serial data generator (see Figure 1), takes a parallel data word up to eight bits wide and converts it into a serial data stream at a rate determined by a variable clock generator.

Two, four bit counters (IC1 and IC2) are connected in series to form an eight bit counter of which six bits are used. This length counter generates a sequence of 64 addresses which drive the six least significant address lines (A0 to A5) of the message ROM (IC4). Address lines A6 and A7 are pulled high and connected to switch S3 which allows up to four individual 64 character messages to be selected. Address lines A8 to A10 are not used for the time being and are tied low. It can be seen that extension of the address counter length and use of the other address lines allows considerable flexibility in message length up to the total ROM capacity of 2048 characters.

The address counter is clocked by the UART transmitter buffer empty signal. This positive going signal indicates that the transmitter data buffer is empty and may be loaded with data. As well as clocking the counter, this line also clocks a one microsecond delay monostable (½ IC3). After the delay, which is to allow the new data time to settle at the UART parallel inputs, a second monostable fires. This mono provides a negative going load pulse to the "transmitter data load" input of the UART which loads the next character to be transmitted.

The data lines from the message ROM drive the parallel transmitter data inputs of the UART (IC6). Each of the data lines is connected to +5 volts through a pull-up resistor and, through a diode and switch (S2/1 to S2/8), to a common line which can be selectively grounded via switch (S4). This switch allows either the message ROM or the group of DIP switches to be selected to provide the parallel data to the UART input.

The transmitter clock oscillator (IC5) is the common 555 operating as an astable oscillator. It generates a square wave signal at a frequency of 16 times the output Baud rate, that is, at 50 Baud it is 800 Hz. The clock frequency is adjusted by a 20 kohm, 15 turn trimpot.

A set of three switches (S1/1 to S1/3) are connected to the UART to select the number of data bits and stop bits. Lines NDB1 (Pin 38) and NDB2 (Pin 37) are used to select the number of data bits needed. Line NSB (Pin 36) select the number of stop bits needed. Table 1 below sets out the options available.

TABLE 1.

NDB1 (Pin 38)	NDB2 (Pin 37)	Bits/Char	NSB (Pin 36)	Stop Bits
L	L	5		
L	H	6	L	1
H	L	7	H	2
H	H	8		

Note that when five data bits are selected, the number of stop bits is set to 1.5 (as necessary for Baudot).

Therefore, by appropriate selection of the above switches and provision of suitable parallel data, either standard Baudot or ASCII formats may be transmitted.

Two other lines are used to select the parity options. NPB (Pin 35) selects parity on or off and POE (Pin 39) selects odd/even parity. In this case, NPB is held high thereby turning parity off.

The serial data appears on line TS0 (Pin 25). A high level corresponds to "mark" and a low level corresponds to "space." The serial data drives the logic input of the XR 2206 function generator through a three position switch (S5). This switch allows either the data line or fixed high or low logic levels to be connected to the function generator. These two fixed levels allow the mark and space frequencies to be accurately set.

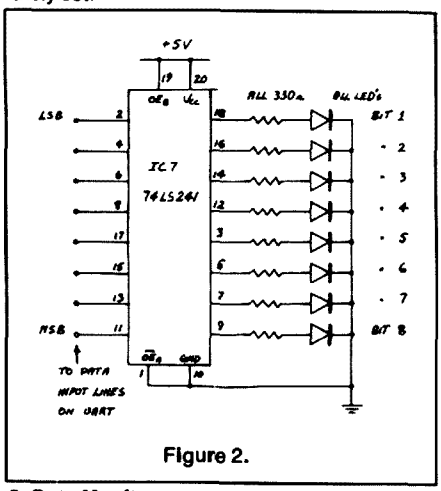

Figure 2.

3. Data Monitor

An octal buffer driving eight LEDs is used to monitor the data being sent. (See Figure 2). Each of the eight inputs to a 74LS241 octal buffer is connected to the eight data inputs to the UART. The buffer outputs drive LEDs through appropriate current limiting resistors. The LEDs in my case consisted of a LED bar display which was a way of getting the eight diodes in a convenient package. Any collection of eight LEDs will do the job.

This monitor is not absolutely necessary and falls into the "it would be nice" category. It just makes sure that the data being seen by the UART is what you think it should be.

4. FSK Oscillator

The XR2206 function generator IC is a very versatile device that has been around for many years. It is capable of generating sine, triangle and square wave signals over a wide range of frequencies. It can be amplitude modulated and, most importantly for this job, it can accept a logic input which causes either of two timing resistors to be selected. (See Figure 3). If one resistor is set to produce the mark frequency, and the other resistor to produce the space frequency, then the circuit becomes a simple FSK oscillator which produces a sine wave on either of two frequencies corresponding to the state of the input logic signal.

The timing capacitor is connected between pins five and six. The timing resistors go between pins seven or eight and ground. The relationship between these component values is simply:

$$f = \frac{1}{RC}$$

The maximum amplitude of the output signal is inversely proportional to the value of the resistor connected to pin three. For a sine wave, the amplitude is about 60 mV per k. Therefore, a value of 50 k would produce a sinusoidal signal of about six volts Peak-to-Peak.

5. EPROM Contents

As described above, this circuit has divided the ROM into a total of 32 messages each 64 characters long. For my testing purposes I

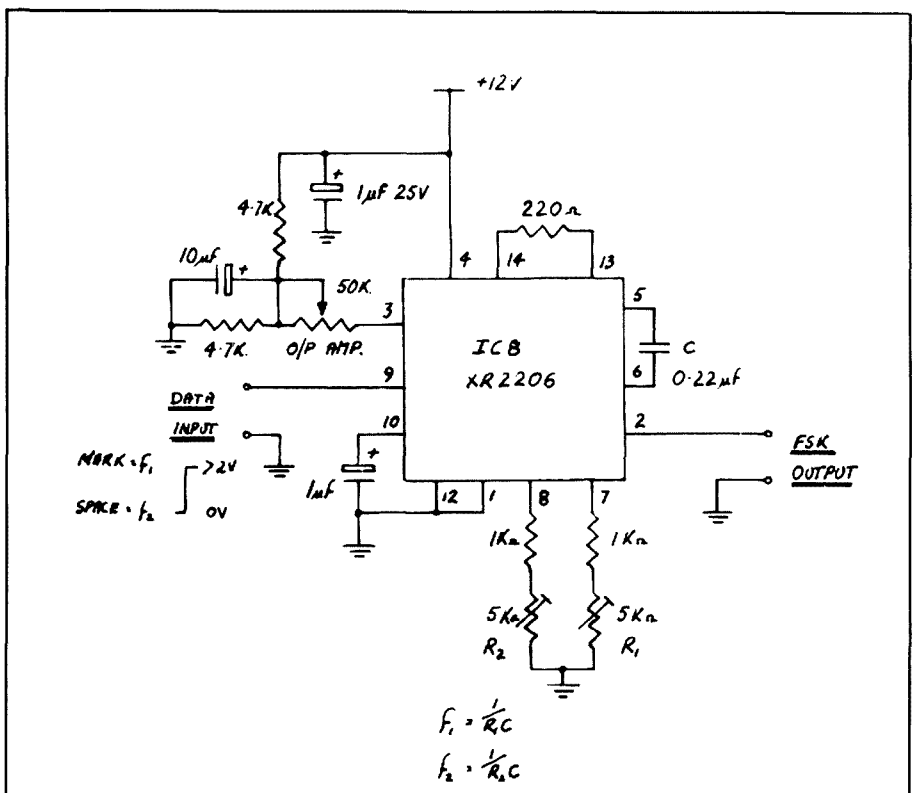

Figure 3.

have only put data into the first two message locations. The first message that extends from Hex addresses 00 to 3F produces the usual "Quick Brown Fox — etc" on one line followed by numbers 0 to 9 and some punctuation on the next. The other message consists of a line of "RYs." I figured that I could use the switches to test anything missed out with these tests. Table 2 gives the complete address/data list in Hex format for both of these messages.

TABLE 2.

MESSAGE 1			MESSAGE 2		
Character	Hex Address	Hex Data	Character	Hex Address	Hex Data
T	00	10	LF	40	02
H	01	14	CR	41	08
E	02	01	R	42	0A
SPACE	03	04	Y	43	15
Q	04	17	R	44	0A
U	05	07	Y	45	15
I	06	06	R	46	0A
C	07	0E	Y	47	15
K	08	0F	R	48	0A
SPACE	09	04	Y	49	15
B	0A	19	R	4A	0A
R	0B	0A	Y	4B	15
0	0C	18	R	4C	0A
W	0D	13	Y	4D	15
N	0E	0C	R	4E	0A
SPACE	0F	04	Y	4F	15
F	10	0D	R	50	0A
O	11	18	Y	51	15
X	12	1D	R	52	0A
SPACE	13	04	Y	53	15
J	14	0B	R	54	0A
U	15	07	Y	55	15
M	16	1C	R	56	0A
P	17	16	Y	57	15
E	18	01	R	58	0A
D	19	09	Y	59	15
SPACE	1A	04	R	5A	0A
O	1B	18	Y	5B	15
V	1C	1E	R	5C	0A
E	1D	01	Y	5D	15
R	1E	0A	R	5E	0A
SPACE	1F	04	Y	5F	15
T	20	10	R	60	0A
H	21	14	Y	61	15
E	22	01	R	62	0A
SPACE	23	04	Y	63	15
L	24	12	R	64	0A
A	25	03	Y	65	15
Z	26	11	R	66	0A
Y	27	15	Y	67	15
SPACE	28	04	R	68	0A
D	29	09	Y	69	15
O	2A	18	R	6A	0A
G	2B	1A	Y	6B	15
SPACE	2C	04	R	6C	0A
LF	2D	02	Y	6D	15
CR	2E	08	R	6E	0A
FGRS	2F	1B	Y	6F	15
0	30	16	R	70	0A
1	31	17	Y	71	15
2	32	13	R	72	0A
3	33	01	Y	73	15
4	34	0A	R	74	0A
5	35	10	Y	75	15
6	36	15	R	76	0A
7	37	07	Y	77	15
8	38	06	R	78	0A
9	39	18	Y	79	15
.	3A	1C	R	7A	0A
,	3B	0C	Y	7B	15
?	3C	19	R	7C	0A
LF	3D	02	Y	7D	15
CR	3E	08	LF	7E	02
LTRS	3F	1F	CR	7F	08

As stated previously, some re-arrangement of the circuit will allow longer messages to be generated up to the capacity limit of the ROM.

CONSTRUCTION

Because the circuit was built as a source of test signals for the decoder, no particular effort was put into the design of neat circuit boards or layouts. Figure 4 shows the form of construction and layout used. It is not a thing of beauty and that is the best side; but it does work.

As can be seen, the circuit was built on a piece of vero-board using a number of wiring techniques ranging from conventional vero-wiring, point- to-point wiring using wire wrap and ribbon cable where the addresses or data had to be moved.

COMPONENTS

There are no particularly special components used in this circuit. The counter and monos may be either 74LS series TTL or even suitable CMOS equivalent. The octal buffer should be capable of providing up to 10 mA to drive each LED. The LEDs may either be one of the bar displays or a row of conventional LEDs which ever is easier.

The switches S2 (data group) and S1 (UART program) are eight-way and four- way DIP switches respectively. They were available and took up less room than ordinary toggles. Switches S3, S4, and S5 are conventional toggles.

The ROM is a 2716 EPROM which is relatively easy to get and inexpensive. It is not a thing of beauty and that is the best side; but it does work.

The UARTs come under a variety of names, depending on manufacturer. The two that I have used are the MM5303 from National and

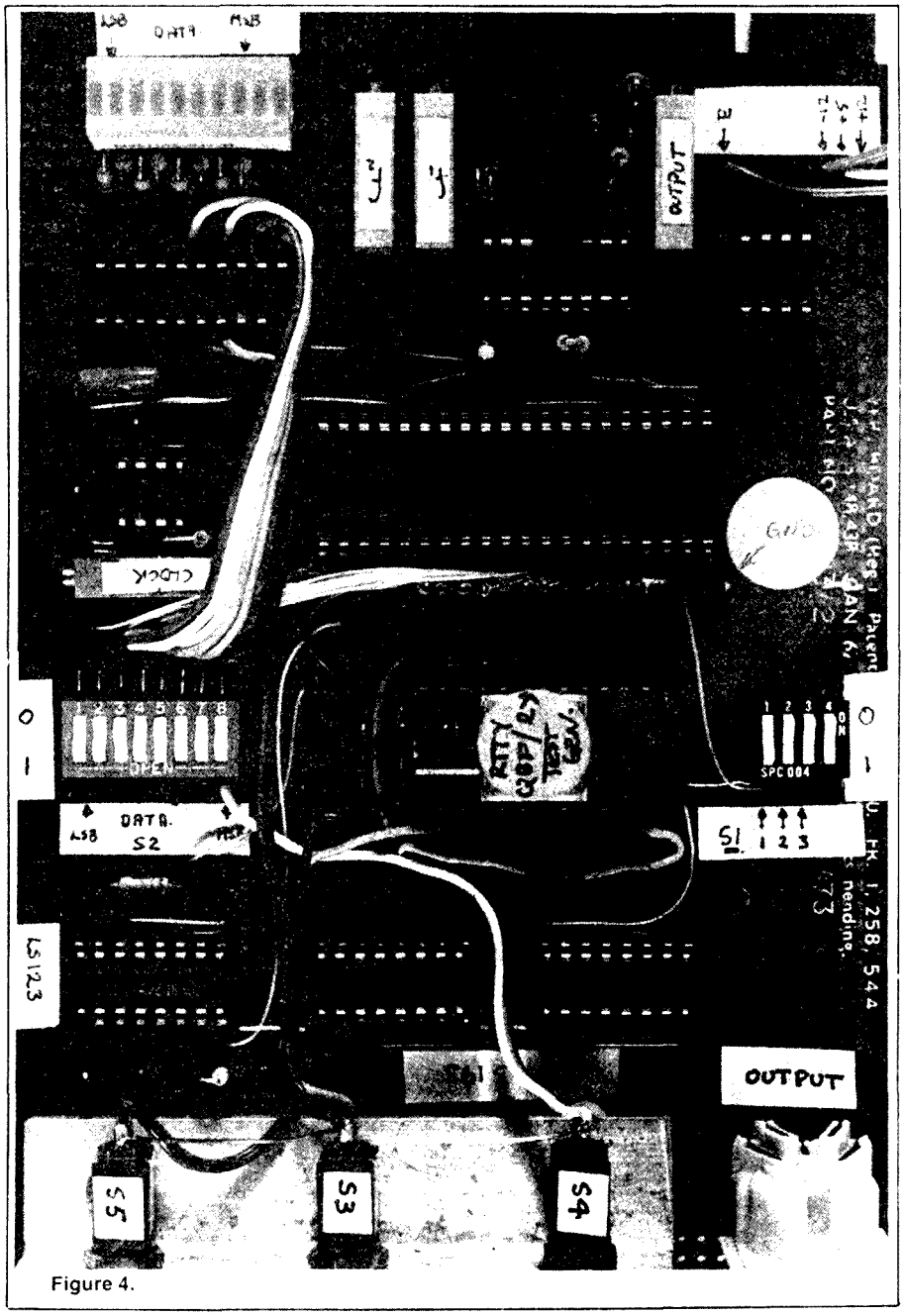

Figure 4.

the TR 1865 from Western Digital. Other similar devices are the 6402 and the AY-3-1015. One significant difference between some of these devices is in the number of power supply voltages required. All require +5 volts but some require -12 volts as well.

Note that if comparing information on different devices, quite often a given pin is identified by different abbreviated names. This is no problem since a comparison of the full data (if available) shows that the manufacturers have given the same physical function different names.

ALIGNMENT

The alignment of this circuit is quite straight forward although the use of a frequency counter is assumed.

Connect the counter to the FSK oscillator output and set S5 to "Set Space." Adjust the potentiometer connected to pin 8 for the correct space frequency. Set S5 to "Set Mark" and adjust the potentiometer connected to pin 7 for the correct mark frequency. The desired output level can be adjusted using either a meter or oscilloscope across the output. Now set S5 to "Data" for correct operation.

Transfer the counter probe to the test point connected to the UART transmit clock line (pin 40). The frequency should be precisely 16 times the desired Baud rate; ie for 50 Baud, the clock frequency should be 800 Hz.

The UART should now be configured for the wanted number of data and stop bits using switches 1, 2, and 3 of DIP switch S1 as per Table 1 in the circuit description.

The last step is to ensure that UART is properly clocking the address counter. If the data monitor is being used, switch S4 to "ROM" and watch the data change as the ROM addresses change.

Operating the message selector switch S3 will cause the message data to change although this can be a little difficult to see depending on the messages in ROM. With the two that I have, it is quite easy. Lastly, operate S4 to the "Switches" position and set up the desired code on the DIP switch S2 and ensure that the data monitor agrees with the switch code.

That completes the alignment. The unit should now be ready to use.

ar

TIDY PACKAGE

The International Telecommunication Union has entrusted the promotion and printing of its monthly *Telecommunication Journal*, together with canvassing for and management of advertising to Horizon House-Microwave Inc, of Massachusetts, USA.

The *Telecommunication Journal* began publication in 1869, only four years after the founding of the International Telegraph Union, which in 1932 became the International Telecommunication Union. It is published in three separate editions: English, French and Spanish.

The journal reports on the work of the ITU and the evolution of telecommunications techniques and systems.

SKY CHANNEL

Australia's domestic satellite, AUSSAT, will be used for a new video and audio entertainment and information service. The service will beam material to hotels, licensed clubs and other similar outlets.

Called *Sky Channel*, and using a 30 watt AUSSAT transport, it is expected to serve 3000 three-metre dishes to be one of the largest private installations of its kind in the world.

The estimated target audience of five million people a week will see a mix of programs including major golf tournaments and other national and international sporting events, horse racing, video rock music and news.

PAPAL VISIT

The Polonia ARC, VK3CRP, was recently granted permission by DOC to use the special call sign, VI3PVA, on all amateur bands despite the novice suffix.

The special call sign was granted to commemorate the Australian visit of Pope John Paul II, this month, hence the suffix PVA — Papal Visit Australia.

The special call sign will be operational from October 1 to December 1.

A commemorative QSL card will be forwarded through the bureau to all stations that contact VI3PVA during this period.

—Contributed by Tad Dobrostanski VK3NCK

AC/DC

A Program for the C64 Computer

Joseph Ortuso VK7NJO
43 Bayfield Street, Bellerive, Tas. 7018

This program performs equations for solving most AC/DC problems in the shack.

If you want to find reactance, resistance, power, frequency, etc and your head forgets the formulas, as many of us do, then this program can make life easier.

The program is very easy to use and when it is run, the first thing on the screen is a menu giving a choice of 10 options, listed from 1 to 10. After the choice has been made with the entry of a particular number, a sub-menu will display the most common equations available for that particular choice.

```
                AC/DC   M E N U

1....resistance or impedance
2....ampere
3....voltage
4....power
5....frequency
6....reactance
7....energy & q factor
8....charge & energy
9....time constant
10...transformers

enter number ?
```

Each of these equations are again numbered and a choice is made for the appropriate one.

At this point, it is necessary to simply answer the first and second prompt with the right value and the result will be printed at the bottom of the screen. Following is a pictorial example as all of this may sound confusing.

Suppose N.4 (POWER) is chosen from the menu, a sub-menu will appear giving a choice of five of the most common equations for POWER:

1. $P = E^2/R$
2. $P = E^2/Z$
3. $P = E \times I$
4. $P = E^2 \times R$
5. $P = I^2 \times Z$

Next, choose N.3 ($P = E \times L$). As soon as number 3 is pressed the screen will again clear and a new screen displays the equation number, together with the actual equation chosen, and asks for the first value — in this case VOLTAGE?. . .just enter 240.

Now, a second value is asked for, AMPERE. . .input .5. When the RETURN is pressed, the answer is printed: POWER = 120. . .

At the end of each equation there is a choice to continue the same sort of equations by pressing -Y- for yes or -N- for no! If -N- is chosen then you are asked if you want to -E- EXIT to the main menu or -Q- Quit the program.

Following are some explanations of how the program works:

The first two pokes in line 5 set the border and screen colour (53280,13) and (53281,3). At the moment the (x) value is set for a monochrome monitor, but this can be changed to the right value for the particular monitor in use as this is very much a matter of personal choice.

Still in line 5, the print statement sets the colour of the characters — black in this case.

(Lines 10 through 90 prints my own logo which I consider to be very much part of the program, but it can be left out if your fingers are not as nimble as mine).

The main menu begins at line 100 through to line 185.

Line 185 is the input line which waits for the input of your choice (alphanumeric).

Line 190 converts the alphanumeric string variable to a numeric one (VAL(C$)). The reason for this conversion is to create a full error-free input routine in line 195, so that if the entry is less than one or greater than 10, or is not a numeric one, the menu will remain on the screen unaltered until the right number is entered.

There has been the same error-free routine placed at each end of the sub- menu, but with a difference: instead of using the input statement as in line 185, to allow the input of your choice, this time the GET statement is used. This eliminated the need to press RETURN after making a choice and also does not give the usual flashing cursor, which can frequently be distracting.

In line 200, it can be seen that each main module starts at line 1000 with intervals of 1000, through line 10000. Line 999, with increments of 1000, has REM statements included to make program analysis easier.

From the previous example, N.4 was chosen from the main menu. Now let us examine the program from line 4000.

Line 3999 starts the beginning of the POWER module.

Line 4000 clears the screen.

Line 4005 contains two gosubs which are instructions to go to line 20041 and print whatever is in that line, and the same for gosub 20450. It may be noticed that a lot of instructions in the program are devoted purely to the cosmetic side, as I believe in not only delivering the result, but on how it is delivered.

Line 4010 through to line 4060 prints the sub-menu for POWER.

Line 4060 has another gosub, this time to line 20510.

Line 20510 prints a line dividing the sub-menu to the bottom half of the screen and it prints: ENTER NUMBER.

Line 20515 waits for the input with the GET statement.

Line 20517 converts the alphanumeric string into a numeric one only.

Line 20520 tells the computer to go back to line 4070.

Line 4070 is a very important one as it tells the computer to accept only an entry of 1 to 5 (if C1 < 1 or C1 > 5) then 4000.

Line 4080 tells the computer that, if C1 = 1 then go to 4200, if C1 = 2 then go to 4300, etc, etc.

In the example, equation N.3 was chosen from the sub-menu, so if C1 = 3 then go to 4500.

Line 4510 prints the equation chosen: P = E x L.

Line 4520 asks for the value of the voltage = E.

Line 4530 asks for the value of ampere = 1.

Line 4540 is the one that actually performs the equation: P = E x L.

Line 4550 prints P.

The routine for E x L ends the last statement in line 4560.

After P has been printed, the program jumps to line 20000 and from this line through line 20030 are the routines which give a choice to continue.

All the other modules in the program are constructed very much the same way, using higher line number increments and symmetry to enable one to augment the program with some other equations.

All of the subroutines are nested at the end of the program beginning at line 20000.

As many people still prefer the old imperial system of measuring, included in the frequency module (choice 5 from the main menu) is a routine which gives the operator a choice of finding frequency or wavelength in either feet or metres.

This program will run on any machine using Basic as long as the formatting side is kept in mind. Some computers use ^ for eponentiation instead of ↑.

```
5 POKE53280,13:POKE53281,3:PRINT"■"
10 FORI=1TO40:PRINT"■";:NEXT
15 FORI=1TO23:PRINT"■";:NEXT
20 FORI=1TO39:PRINT"■";:NEXT
25 FORI=1TO23:PRINT"■";:NEXT
30 PRINT
35 FORI=1TO36:PRINTTAB(2)"■";:NEXT
40 FORI=1TO3 :PRINT"■";:NEXT
45 FORI=1TO35:PRINT"■";:NEXT
50 FORI=1TO3 :PRINT"■";:NEXT
55 PRINTTAB(12)"■FOR COMMODORE 64"
60 PRINTTAB(15)"MARCH 1986"
65 PRINTTAB(1)"■■A PROGRAM GIVING EQUATIONS FOR SOLVING"
70 PRINTTAB(4)"MOST AC/DC PROBLEMS IN THE SHACK"
75 PRINTTAB(8)"■■WRITTEN BY JOSEPH ORTUSO"
80 PRINTTAB(13)"V K 7  N J O"
85 PRINTTAB(8)"■■■■PRESS SPACE TO CONTINUE"
90 GETA$:IFA$<>" "THEN90
100 REM XXXXXXXXXX MENU XXXXXXXXXX
110 PRINT"■":PRINTTAB(12)"■AC/DC   M E N U"
115 PRINTTAB(12)"■■■■■■■■■■■■■■■■■■■■"
120 PRINT"■ ■1■....RESISTANCE OR IMPEDANCE"
125 PRINT"■ ■2■....AMPERE"
130 PRINT"■ ■3■....VOLTAGE"
135 PRINT"■ ■4■....POWER"
140 PRINT"■ ■5■....FREQUENCY"
145 PRINT"■ ■6■....REACTANCE"
150 PRINT"■ ■7■....ENERGY & Q FACTOR"
155 PRINT"■ ■8■....CHARGE & ENERGY"
160 PRINT"■ ■9■....TIME CONSTANT"
165 PRINT"■ ■10■...TRANSFORMERS":GOSUB20530
185 INPUT"■ ENTER NUMBER ■1/10■ "!C$
190 LETC=VAL(C$)
195 IFC<1 OR C>10 THEN110
200 ON C GOTO 1000,2000,3000,4000,5000,6000,7000,8000,9000,10000
999 REM XXXXX RESISTANCE/IMPEDANCE XXXXX
1000 PRINT"■"
1005 GOSUB20035:GOSUB20450
1010 PRINT" ■■1...■RZ= E/I■"!
1020 PRINTTAB(19)"2...■RZ= E SQR/P■"
1030 PRINT" ■3...■RZ= P/I SQR■"!
1040 PRINTTAB(19)"4...■RZ= E SQR COS■/P■"
1050 PRINT" ■5...■RZ= P/I SQR COS■■"
1052 GOSUB20530
1055 PRINT" 1=AMPERE...E=VOLTAGE...P=POWER":PRINT" Z=IMPEDANCE"
1060 N■="■1-5■":GOSUB20510
1070 IFC1<1ORC1>5THEN1000
1080 ON C1 GOTO 1200,1300,1400,1500,1600
1200 GOSUB20065
```

```
1210 GOSUB20035:PRINT"■R= E/I■"
1220 INPUT"■■■ VOLT"¦E
1230 INPUT"■ AMPS"¦I
1240 R=E/I
1250 GOSUB20035:PRINTR"OHM'S"
1260 GOSUB20000:GOSUB20470:GOTO1000
1300 GOSUB20065
1310 GOSUB20035:PRINT"■R= E↑2/P■"
1320 INPUT"■■■ VOLT"¦E
1330 INPUT"■ POWER"¦P
1340 R=E↑2/P
1350 GOSUB20035:PRINTR"OHM'S"
1360 GOSUB20000:GOSUB20470:GOTO1000
1400 GOSUB20065
1410 GOSUB20035:PRINT"■R= P/I↑2■"
1420 INPUT"■■■ POWER"¦P
1430 INPUT"■ AMPERE"¦I
1440 R=P/I↑2
1450 GOSUB20035:PRINTR"OHM'S"
1460 GOSUB20000:GOSUB20470:GOTO1000
1500 GOSUB20065
1510 GOSUB20035:PRINT"■Z= E↑2*COS(0)/P■"
1520 INPUT"■■■ VOLT"¦E
1530 INPUT"■ POWER"¦P
1540 R=E↑2*COS(0)/P
1550 GOSUB20035:PRINTR"OHM'S"
1560 GOSUB20000:GOSUB20470:GOTO1000
1600 GOSUB20065
1610 GOSUB20035:PRINT"■Z= P/I↑2*COS(0)■"
1620 INPUT"■■■ POWER"¦P
1630 INPUT"■ AMPS"¦I
1640 R=P/I↑2*COS(0)
1650 GOSUB20035:PRINTR"OHM'S"
1660 GOSUB20000:GOSUB20470:GOTO1000
1999 REM ■■■■■■■■■■ AMPERE ■■■■■■■■■■■
2000 PRINT"■"
2005 GOSUB20037:GOSUB20450
2010 PRINT" ■■1....■I= E/R■"¦
2020 PRINTTAB(20)"2....■I= E/Z■"
2030 PRINT" ■3....■I= SQR RT P/R■"¦
2040 PRINTTAB(20)"4....■I= SQR RT P/Z■"
2045 PRINT" ■5....■I= P/E■"¦
2050 PRINTTAB(20)"6....■I= E/X■"
2052 GOSUB20530
2055 PRINT" R=RESISTANCE...E=VOLTAGE...P=POWER"
2057 PRINT" Z=IMPEDANCE....X=REACTANCE OHMS"
2060 N0="■I-6■":GOSUB20510
2070 IFC1<1ORC1>6THEN2000
2080 ON C1 GOTO 2200,2300,2400,2500,2600,2700
2200 GOSUB20065
2210 GOSUB20037:PRINT"■I= E/R■"
2220 INPUT"■■■ VOLTS"¦E
2230 INPUT"■ RESISTANCE"¦R
2240 I=E/R
2250 GOSUB20037:PRINTI
2260 GOSUB20000:GOSUB20470:GOTO2000
2300 GOSUB20065
2310 GOSUB20037:PRINT"■I= E/Z■"
2320 INPUT"■■■ VOLTS"¦E
2330 INPUT"■ IMPEDANCE"¦Z
2340 I=E/Z
2350 GOSUB20037:PRINTI
2360 GOSUB20000:GOSUB20470:GOTO2000
2400 GOSUB20065
2410 GOSUB20037:PRINT"■I= P/R↑.5■"
2420 INPUT"■■■ POWER"¦P
2430 INPUT"■ RESISTANCE"¦R
2440 I=P/R
2450 PRINT"■■ ■AMPERE=■"¦I↑.5:PRINT
2460 GOSUB20000:GOSUB20470:GOTO2000
2500 GOSUB20065
2510 GOSUB20037:PRINT"■I= P/Z↑.5■"
2520 INPUT"■■■ POWER"¦P
2530 INPUT"■ IMPEDANCE"¦Z
2540 I=P/Z
2550 PRINT"■■ ■AMPERE=■"¦I↑.5:PRINT
2560 GOSUB20000:GOSUB20470:GOTO2000
2600 GOSUB20065
2610 GOSUB20037:PRINT"■I= P/E■"
2620 INPUT"■■■ POWER"¦P
2630 INPUT"■ VOLTS"¦E
2640 I=P/E
2650 GOSUB20037:PRINTI
2660 GOSUB20000:GOSUB20470:GOTO2000
2700 GOSUB20065
2710 GOSUB20037:PRINT"■I= E/X■"
2720 INPUT"■■■ VOLT"¦E
2730 INPUT"■ REACTANCE"¦X
2740 I=E/X
2750 GOSUB20037:PRINTI
2760 GOSUB20000:GOSUB20470:GOTO2000
2999 REM ■■■■■■■■■■ VOLTAGE ■■■■■■■■■■■
3000 PRINT"■"
3005 GOSUB20039:GOSUB20450
3010 PRINT" ■■1...■E= I*R■"¦
3020 PRINTTAB(20)"2...■E= SQR RT(P*R)■"
3030 PRINT" ■3...■E= P/I■"¦
3040 PRINTTAB(20)"4...■E= I*Z■"
3050 PRINT" ■5...■E= SQR RT(P*Z)■"¦
3052 PRINTTAB(20)"6...■E= I*X■"
3053 PRINT"■ 7...■E= O/C■"
3054 GOSUB20530
3055 PRINT" I=AMPERE...R=RESISTANCE...P=POWER"
3057 PRINT" Z=IMPEDANCE....X=REACTANCE OHMS"
3058 PRINT" O=CHARGE (COLOMB)":PRINT" C=CAPACITANCE (FARADS)
3060 N0="■I-7■":GOSUB20510
3070 IFC1<1ORC1>7THEN3000
3080 ON C1 GOTO 3200,3300,3400,3500,3600,3700,3800
3200 GOSUB20065
3210 GOSUB20039:PRINT"■E= I*R■"
3220 INPUT"■■■ AMPERE"¦I
3230 INPUT"■ RESISTANCE"¦R
3240 E=I*R
3250 GOSUB20039:PRINTE
3260 GOSUB20000:GOSUB20470:GOTO3000
3300 GOSUB20065
3310 GOSUB20039:PRINT"■E= (P*R)↑.5■"
3320 INPUT"■■■ POWER"¦P
3330 INPUT"■ RESISTANCE"¦R
3340 E=P*R
3350 PRINT"■■ ■VOLTAGE=■"¦E↑.5:PRINT
3360 GOSUB20000:GOSUB20470:GOTO3000
3400 GOSUB20065
3410 GOSUB20039:PRINT"■E= P/I"
3420 INPUT"■■■ POWER"¦P
3430 INPUT"■ AMPERE"¦I
3440 E=P/I
3450 GOSUB20039:PRINTE
3460 GOSUB20000:GOSUB20470:GOTO3000
3500 GOSUB20065
3510 GOSUB20039:PRINT"■E= I*Z■"
3520 INPUT"■■■ AMPERE"¦I
3530 INPUT"■ IMPEDANCE"¦Z
3540 E=I*Z
3550 GOSUB20039:PRINTE
3560 GOSUB20000:GOSUB20470:GOTO3000
3600 GOSUB20065
3610 GOSUB20039:PRINT"■E= (P*Z)↑.5■"
3620 INPUT"■■■ POWER"¦P
3630 INPUT"■ IMPEDANCE"¦Z
3640 E=P*Z
3650 PRINT"■■ ■VOLTAGE=■"¦E↑.5:PRINT
3660 GOSUB20000:GOSUB20470:GOTO3000
3700 GOSUB20065
3710 GOSUB20039:PRINT"■E= I*X■"
3720 INPUT"■■■ AMPERE"¦I
3730 INPUT"■ REACTANCE"¦X
3740 E=I*X
3750 GOSUB20039:PRINTE
3760 GOSUB20000:GOSUB20470:GOTO3000
3800 GOSUB20065
3810 GOSUB20039:PRINT"■E= O/C■"
3820 INPUT"■■■ CHARGE (COULOMB)"¦O
3830 INPUT"■ CAPACITANCE (FARADS)"¦C
3840 E=O/C
3850 GOSUB20039:PRINTE"VOLTS"
3860 GOSUB20000:GOSUB20470:GOTO3000
3999 REM ■■■■■■■■■■ POWER ■■■■■■■■■■■■
4000 PRINT"■"
4005 GOSUB20041:GOSUB20450
4010 PRINT" ■■1....■P= E SQR /R■"¦
4020 PRINTTAB(20)"2....■P= E SQR /Z■"
4040 PRINT" ■3....■P= E*I■"¦
4050 PRINTTAB(20)"4....■P= I SQR R■"
4055 PRINT" ■5....■P= I SQR Z■"
4056 GOSUB20530
4057 PRINT" R=RESISTANCE...E=VOLTAGE...I=AMPERE"
4058 PRINT" Z=IMPEDANCE"
4060 N0="■1-5■":GOSUB20510
4070 IFC1<1ORC1>5THEN4000
4080 ON C1 GOTO 4200,4300,4500,4600,4700
4200 GOSUB20065
4210 GOSUB20041:PRINT"■P= E↑2/R■"
4220 INPUT"■■■ VOLTAGE"¦E
4230 INPUT"■ RESISTANCE"¦R
4240 P=E↑2/R
4250 GOSUB20041:PRINTP
4260 GOSUB20000:GOSUB20470:GOTO4000
4300 GOSUB20065
4310 GOSUB20041:PRINT"■P= E↑2/Z■"
4320 INPUT"■■■ VOLTAGE"¦E
4330 INPUT"■ IMPEDANCE"¦Z
4340 P=E↑2/Z
4350 GOSUB20041:PRINTP
4360 GOSUB20000:GOSUB20470:GOTO4000
4500 GOSUB20065
4510 GOSUB20041:PRINT"■P= E*I■"
4520 INPUT"■■■ VOLTAGE"¦E
4530 INPUT"■ AMPERE"¦I
4540 P=E*I
4550 GOSUB20041:PRINTP
4560 GOSUB20000:GOSUB20470:GOTO4000
4600 GOSUB20065
4610 GOSUB20041:PRINT"■P= I↑2*R■"
4620 INPUT"■■■ AMPERE"¦I
4630 INPUT"■ RESISTANCE"¦R
4640 P=I↑2*R
4650 GOSUB20041:PRINTP
4660 GOSUB20000:GOSUB20470:GOTO400
4700 GOSUB20065
4710 GOSUB20041:PRINT"■P= I↑2*Z■"
4720 INPUT"■■■ AMPERE"¦I
4730 INPUT"■ IMPEDANCE"¦Z
4740 P=I↑2*Z
4750 GOSUB20041:PRINTP
4760 GOSUB20000:GOSUB20470:GOTO400
4999 REM ■■■■■■■■■ FREQUENCY ■■■■■■
5000 PRINT"■"
5005 GOSUB20043:GOSUB20450
5010 PRINT" ■■1■....TO FIND WAVELE
5020 PRINT" ■■2■....TO FIND FREQUEN
5025 GOSUB20530
5030 PRINT" F=FREQUENCY(MHZ)...W=WA
5060 N0="■1-2■":GOSUB20510
5070 IFC1<1ORC1>2THEN5000
5080 ON C1 GOTO 5200,5300
5200 GOSUB20065
5210 GOSUB20044:PRINT"■W= V/F■"
5220 INPUT"■■■ FREQUENCY.MHZ"¦F
5230 V=300:W=V/F
5240 V1=300/0.305:W1=V1/F
5250 GOSUB20044:PRINTW"(MT)":PRINTT
5260 GOSUB20000:GOSUB20470:GOTO5000
5300 GOSUB20065
5310 GOSUB20043:PRINT"■F= V/W■"
5315 PRINT"■■■ ENTER WAVELENGTH"
5320 PRINT" (IN METERS OR FEET?)"¦I
5325 PRINT"■ "W$";:INPUT". WAVELENGT
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5330 IFW$="M"THEN2#=300:F=U/W
5340 IFW$="F"THEN2#=300/0.305:F=U/W
5350 GOSUB20043:PRINTF"HZ"
5360 GOSUB20000:GOSUB20470:GOTO5000
5999 REM ********* REACTANCE ******
6000 PRINT"J"
6005 GOSUB20045:GOSUB20450
6010 PRINT" [1]....XL=2*F*L"
6020 PRINT" [2].....XC=1/2*F*C"
6030 PRINT" [3].....X=E/I"
6035 GOSUB20530
6040 PRINT" XL=INDUCTIVE REACTANCE"
6050 PRINT" XC=CAPACITIVE REACTANCE
6055 PRINT" F=FREQUENCY HERTZ"1
6057 PRINT" ....X=REACTANCE OHMS"
6060 N$="[1-3]":GOSUB20510
6070 IFC1<1ORC1>3THEN6000
6080 ON C1 GOTO 6200,6300,6400
6200 GOSUB20065
6210 GOSUB20045:PRINT"XL= 2*F*L"
6220 INPUT"[1] FREQUENCY HERTZ"1F
6230 INPUT" INDUCTANCE HENRY"1L
6240 XL=2*3*F*L
6250 PRINT" INDUCTIVE";PRINT" REAC
6260 GOSUB20000:GOSUB20470:GOTO6000
6300 GOSUB20065
6310 GOSUB20045:PRINT"XC= 1/2*F*C
6320 INPUT"[1] FREQUENCY HERTZ"1F
6330 INPUT" CAPACITANCE FARADS"1C
6340 XX=2*3*F*C:XC=1/XX
6350 PRINT" CAPACITIVE REACT.="1XC
6360 GOSUB20000:GOSUB20470:GOTO6000
6400 GOSUB20065
6410 GOSUB20045:PRINT"X= E/I"
6420 INPUT"[1] VOLT"1E
6430 INPUT" AMPS"1I
6440 X=E/I
6450 GOSUB20045:PRINTX"OHMS"
6460 GOSUB20000:GOSUB20470:GOTO6000
6999 REM ******** ENERGY & Q **********
7000 PRINT"J"
7005 GOSUB20047:GOSUB20450
7010 PRINT" [1]....L=LXI SOR /2"1
7020 REM PRINT"     [2]....C=2N-LXI SOR"
7030 PRINT"     [2]....L=SOR RT 2N/C"
7035 PRINT" [3]....C=2N*I SOR"1
7040 PRINT"     [4]....Q=XL/R"
7042 GOSUB20530
7045 PRINT" W=ENERGY (JOULES)..L=INDUCTANCE (HENRY)"
7050 PRINT" CI=CURRENT (AMPERE)"
7055 PRINT" XL=INDUCTIVE REACTANCE (OHM)":PRINT" R=RESISTANCE...Q=Q FACTOR"
7060 N$="[1-4]":GOSUB20510
7070 IFC1<1ORC1>4THEN7000
7080 ON C1 GOTO 7200,7400,7500,7600
7200 GOSUB20065
7210 GOSUB20047:PRINT"W= LXI^2/2"
7220 INPUT"[1] INDUCTANCE HENRY"1L
7230 INPUT" AMPERE"1I
7240 W=LXI^2/2
7250 GOSUB20047:PRINTW" JOULES"
7260 GOSUB20000:GOSUB20470:GOTO7000
7400 GOSUB20065
7410 GOSUB20047:PRINT"L= 2W/I^1.5"
7420 INPUT"[1] JOULES"1W
7430 INPUT" INDUCTANCE"1L
7440 I=2W/L
7450 GOSUB20047:PRINTSQR(I)"AMPERE"
7460 GOSUB20000:GOSUB20470:GOTO7000
7500 GOSUB20065
7510 GOSUB20047:PRINT"L= 2W/I ^2"
7520 INPUT"[1] JOULES"1W
7530 INPUT" AMPERE"1I
7540 L=2W/I^2
7550 GOSUB20047:PRINTL"HENRY"
7560 GOSUB20000:GOSUB20470:GOTO7000
7600 GOSUB20065
7610 PRINT" [2]Q FACTOR";PRINT"     Q=XL/R"
7620 INPUT"[1] INDUCTIVE REACT.(OHM'S)"IXL
7630 INPUT" RESISTANCE"1R
7640 Q=XL/R
7650 PRINT" Q FACTOR= "1Q
7660 GOSUB20000:GOSUB20470:GOTO7000
7999 REM ****** CHARGE & ENERGY ********
8000 PRINT"J"
8005 GOSUB20050:GOSUB20450
8010 PRINT" [1]....Q=CXE"
8020 PRINT" [2]....E=FXI"
8030 PRINT" [3]....E=Q/C"
8035 GOSUB20530
8040 PRINT" Q=CHARGE (COULOMBS)...E=VOLTAGE"
8045 PRINT" C=CAPACITANCE (FARAD)"
8050 PRINT" W=ENERGY IN WATT HOURS"
8055 PRINT" P=POWER IN WATTS"
8057 PRINT" T=TIME IN HOURS"
8061 N$="[1-3]":GOSUB20510
8070 IFC1<1ORC1>3THEN8000
8080 ON C1 GOTO 8200,8300,8400
8200 GOSUB20065
8210 GOSUB20050:PRINT"Q= CXE"
8220 INPUT"[1] CAPACITANCE (FARAD)"1C
8230 INPUT" VOLTAGE"1E
8240 Q=CXE
8250 GOSUB20050:PRINTQ"CHARGE (COULOMB.)"
8260 GOSUB20000:GOSUB20470:GOTO8000
8300 GOSUB20065
8310 GOSUB20050:PRINT"W= PXT"
8320 INPUT"[1] POWER IN WATTS"1P
8330 INPUT" TIME IN HOURS"1T
8340 W=PXT
8350 PRINT" ENERGY="W"WATT HOURS"
8360 GOSUB20000:GOSUB20470:GOTO8000
8400 GOSUB20065
8410 GOSUB20050:PRINT"E= Q/C"
8420 INPUT"[1] CHARGE (COULOMB)"1Q
8430 INPUT" CAPACITANCE (FARADS)"1C
8440 E=Q/C
8450 PRINT" VOLTAGE="E"VOLTS"
8460 GOSUB20000:GOSUB20470:GOTO8000
8999 REM ******* TIME CONSTANT ********
9000 PRINT"J"
9005 GOSUB20052:GOSUB20450
9010 PRINT" [1]....TC=L/R"
9020 PRINT" [2]....TC=RXC"
9025 GOSUB20530
9030 PRINT" R=RESISTANCE...L=INDUCTANCE (HENRY)"
9035 PRINT" C=CAPACITANCE (FARAD)"
9060 N$="[1-2]":GOSUB20510
9070 IFC1<1ORC1>2THEN9000
9080 ON C1 GOTO 9200,9300
9200 GOSUB20065
9210 GOSUB20052:PRINT"TC= L/R"
9220 INPUT"[1] INDUCTANCE (HENRY)"1L
9230 INPUT" RESISTANCE"1R
9240 TC=L/R
9250 GOSUB20052:PRINTTC"SECONDS"
9260 GOSUB20000:GOSUB20470:GOTO9000
9300 GOSUB20065
9310 GOSUB20052:PRINT"TC= RXC"
9320 INPUT"[1] RESISTANCE"1R
9330 INPUT" CAPACITANCE (FARAD)"1C
9340 TC=RXC
9350 GOSUB20052:PRINTTC"SECONDS"
9360 GOSUB20000:GOSUB20470:GOTO9000
9999 REM ******* TRANSFORMERS **********
10000 PRINT"J"
10005 GOSUB20055:GOSUB20450
10010 PRINT" [1]....ES=EP*N"1
10020 PRINT"          2....N=TS/TP"
10030 PRINT" [3]....Z.RATIO=SQR RT Z"1
10035 PRINT" 4..Z.RATIO=N SQR"
10037 GOSUB20530
10040 PRINT" ES=SECONDARY VOLTAGE"
10042 PRINT" EP=PRIMARY VOLTAGE..."1
10044 PRINT" N=TURN RATIO"
10046 PRINT" Z=IMPEDANCE RATIO"
10047 PRINT" TP=PRIMARY TURNS..."1
10048 PRINT" TS=SECONDARY TURNS"
10060 N$="[1-4]":GOSUB20510
10070 IFC1<1ORC1>4THEN10000
10080 ON C1 GOTO 10200,10300,10400,10500
10200 GOSUB20065
10210 GOSUB20055:PRINT"E(S)= E(P)N"
10220 INPUT"[1] VOLTAGE (PRIMARY)"1EP
10230 INPUT" TURN RATIO"1N
10240 ES=EP*N
10250 PRINT:PRINTES"VOLT (SECONDARY)"
10260 GOSUB20000:GOSUB20470:GOTO10000
10300 GOSUB20065
10310 GOSUB20055:PRINT"N= TS/TP"
10320 INPUT"[1] TURNS (SECONDARY)"1TS
10330 INPUT" TURNS (PRIMARY)"1TP
10340 N=TS/TP
10350 PRINT:PRINT" TURN RATIO OF"N
10360 GOSUB20000:GOSUB20470:GOTO10000
10400 GOSUB20065
10410 GOSUB20055:PRINT"Z= Z1.5"
10420 INPUT"[1] IMPED.RATIO"1Z
10440 N=Z1.5
10450 PRINT:PRINT" TURNS RATIO OF"N
10460 GOSUB20000:GOSUB20470:GOTO10000
10500 GOSUB20065
10510 GOSUB20055:PRINT"Z= N^2"
10520 INPUT"[1] TURNS RATIO"1N
10540 Z=N^2
10550 PRINT:PRINT" IMPED.RATIO OF"Z
10560 GOSUB20000:GOSUB20470:GOTO10000
20000 GOSUB 20530
20002 PRINT"[1]  ANOTHER EQUATION ? [Y/N]"
20003 RETURN
20005 PRINT"[2]  [E]XIT TO MAIN MENU   OR   [Q]UIT"
20010 GOSUB 20515
20015 IFC$<>"E"ANDC$<>"Q"THEN20010
20020 IFC$="E"THEN RESTORE:GOTO110
20030 PRINT"J":END
20035 PRINT" [2]RESISTANCE/IMPEDANCE:[2] "1:RETURN
20037 PRINT" [2] AMPERE:[2] "1:RETURN
20039 PRINT" [2] VOLTAGE:[2] "1:RETURN
20041 PRINT" [2] POWER:[2] "1:RETURN
20043 PRINT" [2] FREQUENCY:[2] "1:RETURN
20044 PRINT" [2] WAVELENGTH:[2] "1:RETURN
20045 PRINT" [2] REACTANCE:[2] "1:RETURN
20047 PRINT" [2] ENERGY :[2] "1:RETURN
20050 PRINT" [2] CHARGE & ENERGY:[2] "1:RETURN
20052 PRINT" [2] TIME CONSTANT:[2] "1:RETURN
20055 PRINT" [2] TRANSFORMERS:[2] "1:RETURN
20045 PRINT"J";PRINT" YOUR EQUATION N."C1"IS:"
20060 RETURN
20450 PRINTTAB(20)" WHICH EQUATION"
20460 RETURN
20470 GOSUB 20515
20480 IFC$<>"Y"ANDC$<>"N"THEN20470
20490 IFC$="N"THEN20005
20500 RETURN
20510 FORI=1TO40:PRINT"-";:NEXT:PRINT" [2]  ENTER NUMBER "1N
20515 GETC$:IFC$=""THEN20515
20517 LETC1=VAL(C$)
20520 RETURN
20530 FORI=1TO40:PRINT"_";:NEXT
20540 RETURN
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THOUGHT FOR THE MONTH

A smile — none is so rich or mighty that they can get along without it, and none is so poor that they are not made rich by it.

UHF TELEVISION

Australian UHF television has had a recent channel re- shuffle by reducing the channel spacing from eight to seven megahertz. This has resulted in an additional seven channels. The UHF segments are divided into two halves — there is Band Four which extended from 526 to 582 MHz, Channels 28-35. There is then a gap of 21 to 603 MHz, the start of Band Five at Channel 39. It continues unbroken to 820 MHz, which is Channel 69.

It is interesting to note the highest Band Four channel — 35 — covers six of the nine megahertz of the amateur 50 cm segment. Many ATV systems refer to the operation as being on Channel 34, it is better referred to as Channel 35.

In VK1 and 2, the high power UHF systems are currently for the SBS service. There is Channel 28 in Sydney with 300 kW and Canberra has 200 kW. Newcastle SBS is on Channel 45, with 300 kW. Wollongong is on Channel 59 with 600 kW.

There are several translator networks in existence. The Kings Cross translator has five channels with 1 kW output. The channels used are 46, 49, 52, 55 and 58.

The Central Coast is to have three translator networks. The first has been established in Gosford, with the same channels as Kings Cross. To date the network has the Sydney and Newcastle commercial channels at 200 watts output. Further channels will be added later. Each Central Coast site has an eight channel capacity.

Elsewhere, there are some single translator systems to supply small regions, the channels currently being on Channel 66 and 69 with power outputs between 200 and 8 watts. The SBS has Channel 58 outlets at Goulburn, Cooma, and Tuggeranong in VK1. North Wollongong has a 2.5 kW translator for the ABC on Channel 50 and SBS on 44.

The Government has announced that future television expansion will be in the UHF region. This policy is not being accepted by some sections of the community who keep demanding VHF outlets. UHF is used extensively and in some cases, exclusively in parts of Europe.

SYDNEY

Multicultural Television Service

Service Area:

In Sydney, in and around the city within the area bounded by the Hawkesbury River to the north, the Blue Mountains to the west, and the Royal National Park to the south.

Location of the transmitter — Gore Hill

PARENT STATION	UHF FREQUENCY CHANNEL	UHF CHANNEL
SBS	526-533 MHz	28

Polarisation is horizontal. (Note: A Band IV aerial is required).

Kings Cross

Service Area:

Edgecliff, Darlinghurst, Surry Hills, Redfern, Darlington, Chippendale, East Sydney, Wooloomooloo, Kings Cross, parts of Potts Point, Rushcutters Bay, Double Bay, Kirribilli, Milson's Point and parts of Elizabeth Bay, Darling Point, Paddington, Sydney City, North Sydney, Waverton, Neutral Bay, Cremorne Point, and Clifton Gardens.

Location of Translators — on top of the Hyatt Kingsgate Hotel, Kings Cross.

PARENT STATION	UHF FREQUENCY CHANNELS	UHF CHANNEL
ABN (ABC)		
2 (VHF)	652-659 MHz	46
ATN 7 (VHF)	673-680 MHz	49
TCN 9 (VHF)	694-701 MHz	52
TEN 10 (VHF)	715-722 MHz	55
SBS 28 (UHF)	736-743 MHz	58

Polarisation is horizontal. (Note: A band V aerial is required).

DESIGNATION & FREQUENCY LIMITS OF AUSTRALIAN TELEVISION CHANNELS

CHANNEL NO	VISION CARRIER FREQUENCY — MHZ	FREQUENCY LIMITS — MHz
BAND I		
0	46.25	45-52
1	57.25	56-63
2	64.25	63-70
BAND II		
3	86.25	85-92
4	95.25	94-101
5	102.25	101-108
BAND III		
5A	138.25	137-144
6	175.25	174-181
7	182.25	181-188
8	189.25	188-195
9	196.25	195-202
10	209.25	208-215
11	216.25	215-222
BAND IV		
28	527.25	526-533
29	534.25	533-540
30	541.25	540-547
31	548.25	547-554
32	555.25	554-561
33	562.25	561-568
34	569.25	568-575
35	576.25	575-582
BAND V		
39	604.25	603-610
40	611.25	610-617
41	618.25	617-624
42	625.25	624-631
43	632.25	631-638
44	639.25	638-645
45	646.25	645-652
46	653.25	652-659
47	660.25	659-666
48	667.25	666-673
49	674.25	673-680
50	681.25	680-687
51	688.25	687-694
52	695.25	694-701
53	702.25	701-708
54	709.25	708-715
55	716.25	715-722
56	723.25	722-729
57	730.25	729-736
58	737.25	736-743
59	744.25	743-750
60	751.25	750-757
61	758.25	757-764
62	765.25	764-771
63	772.25	771-778
64	779.25	778-785
65	786.25	785-792
66	793.25	792-799
67	800.25	799-806
68	807.25	806-813
69	814.25	813-820

—Contributed by Tim Mills VK2ZTM

A MEETING WITH JACK . . .

Bob Geeves VK7KZ
28 Hamilton Street, West Hobart, Tas. 7000

I read the article about Jack Sykes in *Amateur Radio* (see July, page 49), only a matter of weeks before setting out with my wife and son for the United Kingdom. My wife said that, as Slaithwaite was in the area of Yorkshire in which we would be travelling, why didn't we take the copy of AR with us and see if we could manage to call in and show it to Jack Sykes. I thought that was a good idea.

On the day concerned, we were visiting a friend, Shaun, at Huddersfield, West Yorkshire, and asked him for directions to Slaithwaite. Shaun replied, in his Irish accent (an Irishman in Yorkshire? Well, if the Yorkshiremen can understand *each other,* they can understand an Irishman, and vice versa!), that Slaithwaite was only a short distance away, about half-an- hour's drive.

That would seem to present no problem to ordinary people, but my wife and I have a talent for getting lost in England, so we contemplated the "short drive" with some trepidation. (I have to comment here that I was driving and my wife was navigating, and I am not saying *whose* fault it was that we kept getting lost, but when you are driving you can't look at a map at the same time, can you?) . . .

Anyhow, we eventually found the road leading to Slaithwaite, and were there before we knew it. We then had to stop and ask directions of the locals. One of them told us that the town was *full* of Sykes, but when I showed him Jack's picture in AR he recognised him immediately. "Of course!", he exclaimed, "The old man in broadcasting! Lives up on hill. Bear right at corner, follow road, bear left at next corner, and go to top of hill." (They have a very economical speech in Yorkshire — why waste breath saying "the" and "a" . . .!)

We followed those instructions and found ourselves high in the Pennines in front of a sandstone house which could have featured in "All Creatures Great and Small," with a three element beam in the front. This *had* to be the house.

Mr and Mrs Sykes were thrilled that we had come all the way from Australia to show them his photo in the Australian AR.

We spent about an hour with then, and would have spent longer but it was right on dinner time and we had to get back to our hotel before dark — we can get lost quite easily in daylight without compounding matters trying to find our way about Yorkshire in darkness.

Jack is devoting much of his time to computers and programming and, as the article in AR stated, is soon to convert his garage into a computer workshop. They regularly visit the United States as they have children there, and Jack spends most of his time on air talking to amateurs in the USA. They both love cats, but have only one at the moment — a male called Jane, who was found up a tree in a bag. It could only happen in Yorkshire . . .

We were struck by the seemingly limitless energy and enthusiasm for everything that Mr and Mrs Sykes have. If we can be as full of life as they are when we are even in our 50s (they are in their 80s) we will be content.

A little tip Jack gave me concerning Morse was, that if you stick your Morse key down with *Blue—Tack* — just a small amount at each corner — it will not move around. His hasn't budged for years.

Jack gave me a short story (true) for publishing in AR. "And," he said, "I thought it was rather humorous, and shall be very peeved if your readers think otherwise."

Jack (left) shows Bob his shack. The infamous AR is in the foreground.

AN UNFORGETTABLE JOURNEY

A true story by John Lingards Sykes

I was returning to my radio school at Edinburgh after a long weekend at my Yorkshire home and I was a very worried young man. In two weeks time I would be sitting an examination in which success could mean an honourable career in the merchant navy, failure a place in a very long dole queue. Surprisingly, the *Flying Scotsman* was half empty at York and I managed to secure a compartment to myself, or so I thought, but at the very last moment a very presentable girl of my own age bounced into the compartment, swung a neat suitcase onto the rack, sat herself down in the corner seat diagonally opposite and quickly buried her head in a thick book. Not a smile, not a word: I might have been invisible. Well, if that was the way she wanted it I would have to talk to myself, in Morse, of course, tapping out my thoughts on the window pane.

Such was my state of mind that for the next 20 minutes my tapping was all about my forthcoming examination — what marks could I expect in the various subjects, which subjects I most needed to revise, what would I do if I failed? It was a melancholy exercise and my weary fingers craved a new tune. Almost of their own volition they started to beat out reflections on my fair companion. What was her name, where was she going, why couldn't I have a girl like her, would she scream or pull the emergency cord if I tried to kiss her? But the imagination, when once aroused, can take the bit between its teeth and gallop on quite out of control . . . How far it might have gone I dread to think but it came to a shuddering halt when I became aware of frantic tapping from the other end of the compartment, a rapid string of dots which I read as 'Stop I want to transmit' . . .

My arm fell to my side as though struck with paralysis. My eyes opened in horror and my face caught fire, but my ears utterly refused to close and for the next 10 minutes I was compelled to listen to Morse more searing than a branding iron. Mercifully there is a limit to the number of adjectives in the vocabulary of any properly brought up young lady and eventually there came a break sign, followed by "I do not know how you will fare in your examination but I give you eight out of ten for Morse sending, ten out of ten for imagination, twenty out of ten for cheek and zero for discretion. Now come and kiss me or I will both scream and pull the communication cord."

I am afraid it was a most unsatisfactory peck but, never mind, practice ought to bring improvement and Edinburgh was still four hours away. My self confidence returned with a rush and soon we were jabbering away like old shipmates. She was a telegraphist in the *Women's Royal Naval Service* and her Morse was better than mine.

"What is the book I thought you were reading so intently?"

"Crime and Punishment."

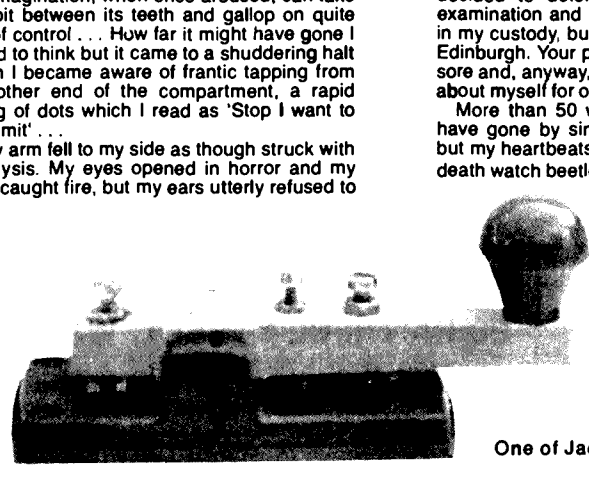
"Oh dear; have you decided on mine?"

"You are guilty of careless talk, a serious offence under the defence of the Realm Act."

"And my punishment?"

"It could be the Tower of London but I have decided to defer sentence until after your examination and until then you are remanded in my custody, but no more Morse this side of Edinburgh. Your poor finger tips must be quite sore and, anyway, I have learned quite enough about myself for one day, my giftie."

More than 50 winters and a few summers have gone by since that memorable journey but my heartbeats still tap out her name and a death watch beetle answers . . . . . .



One of Jack's keys.

LAND AND SEA SAFARI

Introducing Dick Lee, who at the time your Editor met him, quite by chance, in Cairns towards the end of August was about to become a VK4, replacing the call P29RL which he has held for many years. Dick, who was originally VK2ZNL, is a vulcanologist by profession and has been based in Rabaul for most of his time in Papua New Guinea.

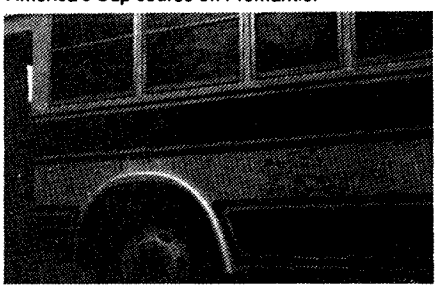
Dick and two PNG yachtsmen who are also amateurs (P29EI and P29MO) have been preparing for months to travel to Perth for the America's Cup. The two yachts (one 12 and the other 14 metres long) were scheduled to arrive in Cairns about September 18, and leave at the end of the month for VK6. Dick will set out by road at about the same time to provide a shore support facility. He and one or two companions will be travelling in the converted bus (ex Port Moresby municipal transport) shown in the photographs. Since bringing the bus to Australia with him Dick has rebuilt its interior, and it is now a luxurious mobile home as well as a multiband amateur station. The roof carries banks of solar cells for auxiliary power supply, and also a solar water-heating system to cater not only for a commodious kitchen, but also a built-in bath and shower!

The "roo-bar" is a VK4 addition.

Both amateur and marine band HF contact will be maintained with the yachts as they proceed through Torres Strait and across to Darwin. The

All aboard for VK6?

bus (fondly known as "Hanua Hound" will in the meantime travel via Townsville, Mt Isa and Tennant Creek to Darwin, where both the land and sea crews expect to remain for about a week. Probably they will have reached Darwin by the time you read this. Then, early in November, they will progress around the WA coast, with Dick maintaining contact from the highway. They expect to rendezvous several times at such places as Derby, Broome, Port Hedland, Carnarvon and Geraldton, arriving in Perth during January 1987 to join the vast array of spectator craft around the America's Cup course off Fremantle.



"Hanua Hound" on the side of the bus. (His name is yet to be added).

Frequencies to be used on the amateur bands have not been finalised at the date of writing, but probably the 80, 40 and 20 metre bands will all be used as they proceed around the Kimberley coast and head south. Both the road and sea parties will welcome OSOs with DX and VK stations generally.

Contributed by Bill Rice VK3ABP
ar

SUMMARY OF CURRENTLY LICENCED STATIONS

This summary outlines details of amateur and citizen band stations currently licensed. Stations in respect of which licenses have been due for renewal for more than three months have been excluded from the listing. Figures are for the quarter ended June 1986.

Stations operated in Australian external territories have been included with those stations operating in neighbouring States of the Australian mainland in accordance with the following listing:

Antarctica — Tasmania; Christmas and Cocos-Keeling Islands — Western Australia; Norfolk Island — New South Wales.

STATION	ACT	NSW	VIC	QLD	SA	NT	WA	TAS	TOTAL
AMATEUR									
Beacon	2	19	18	28	5	1	23	2	98
Limited	56	864	1031	369	271	26	223	104	2944
Limited/Novice	16	333	306	227	127	19	93	42	1163
Novice	52	905	764	613	331	51	219	96	3031
Unrestricted	178	2785	2458	1410	1045	77	903	345	9201
									16437
Citizen Band									
27 MHz	533	29705	31798	26988	12695	742	10617	3707	116785
UHF	186	13913	14518	16555	13949	219	7272	2312	68924
									185709
Repeater									
Amateur	2	45	50	28	12	2	13	12	164
CBRS	-	30	20	39	14	1	19	8	131
									295

SCHEDULE OF COUNTRIES WITH WHICH AUSTRALIA HAS RECIPROCAL LICENSING ARRANGEMENTS

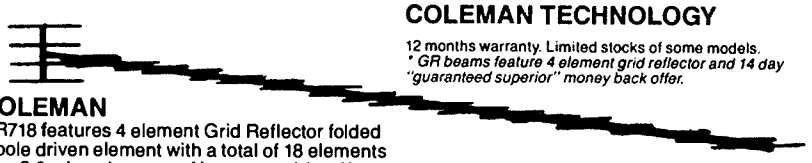
ADMINISTRATION	CLASS OF CERTIFICATE OR LICENCE HELD	AUSTRALIAN AMATEUR LICENCE FOR WHICH HOLDER IS ELIGIBLE	REMARKS
Canada	Advanced Amateur Certificate of Proficiency in Radio Amateur Certificate of Proficiency in Radio	Full Privilege	
France	Radio Amateur Station Licence Group D and E Group C Group B	 Full Privilege Limited Novice	
India	Amateur Wireless Telegraphy Station Licence	Full Privilege	
Israel	Radio Amateur Licence Class A Radio Amateur Licence Class B Radio Amateur Licence Class C	Full Privilege Limited/Novice (Combined Licence) Novice	
Japan	First and Second Class Amateur Radio Operator Certificate Telephone Class Amateur Radio Operator Certificate Telegraph Class Amateur Radio Operator Certificate	Full Privilege Limited Novice	 Telephone operation only on frequency bands above 30 MHz with 10 watts maximum power
Malaysia	Amateur Station Licence Amateur Station Licence	Full Privilege Limited	Where applicant provides acceptable evidence of having qualified in telegraphy at a speed of 12 or more words-per-minute Where no acceptable evidence of telegraphy qualifications is provided
New Zealand	General Amateur Operator's Certificate Limited Amateur Operator's Certificate Novice Amateur Operator's Certificate	Full Privilege Limited Novice	
Papua New Guinea	Amateur Licence Amateur Licence (Limited) Novice Licence	Full Privilege Limited Novice	
Poland*	Amateur Licence Kategoria (Category) (1) Pierwsza (Class A) (2) Drugiej (Class B)	 Combined Novice/Limited Limited	* This is a "de facto" arrangement between Poland and Australia. Polish authorities recognise Certificates issued by countries which recognise Polish qualifications, without having concluded an agreement.
Singapore	Amateur Station Licence Amateur Station Licence	Full Privilege Limited	Subject to the applicant furnishing evidence of having qualified in telegraphy at a speed of 12 or more words-per-minute Where no acceptable evidence is furnished of telegraphy qualifications
Switzerland	Amateur Radio Telegraphist's Certificate (Transmission)	Full Privilege	
United Kingdom	Amateur (Sound) Licence Amateur (Sound) Licence A Amateur (Sound) Licence B	Full Privilege Full Privilege Limited	Pre- 1964 Licence categories A and B introduced 1964
United Stated of America	Extra Class Licence Advanced Class Licence General Class Licence Conditional Class Licence Technician Class Licence Novice Class Licence	Full Privilege Full Privilege Full Privilege Full Privilege Limited/Novice	 Not acceptable
West Germany	Deutsche Bundespost Class B Licence Deutsche Bundespost Class C Licence Deutsche Bundespost Class A Licence	Full Privilege Limited Novice	

INSATIABLE APPETITE

Amateur Radio is always in need of a steady supply of articles for publication, whether they be short technical tips or long technical articles; even interesting anecdotes. Whilst articles on advanced and new techniques are needed, it must not be forgotten that new amateurs and novices are always interested in good basic items which the "seasoned amateur" may class as too basic for AR. So, write-up that project that has worked for you, as *Amateur Radio* has an enormous appetite for a well-balanced and varied diet.

Preparing an article for *Amateur Radio* is very simple. Just commit your thoughts to paper as you would when explaining to a friend over the air. Manuscripts may be clearly hand-written or typed original copies (no photocopies please, as frequently the photocopier prints a blank in a crucial portion of a technical explanation or formula). Include circuit diagrams if applicable — they do not have to be ready for publication (clear sketches are adequate), as AR's draughts-people will redraw them. Don't overlook a photograph too, but please be careful when writing captions on the back — many good photos have been damaged by heavy ball-point pen marks coming through or felt-tip pens smudging from the back of one photo to the front of another.

ANDREWS COMMUNICATIONS SYSTEMS



COLEMAN TECHNOLOGY

12 months warranty. Limited stocks of some models.
** GR beams feature 4 element grid reflector and 14 day "guaranteed superior" money back offer.*

COLEMAN

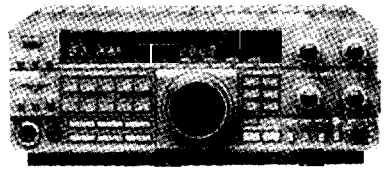
GR718 features 4 element Grid Reflector folded dipole driven element with a total of 18 elements on a 3.6m long boom . . . **No reasonable offer refused!**

NEW COLEMAN BEAMS.
- GR728, 28 el on 430 MHz band
- GR210, 10 el on 144 MHz band
- 603Y, 605Y, 606Y 52 MHz beams

COLEMAN BEAMS NOW IN STOCK
- 2m models, 204Y . . .$19, 205Y . . . $29, 208Y . . . $49, 2011Y . . . $69. ● 208x8 dual-polarity . . . $119. All feature wide-spacing and gamma matching.
- 10/11m 3 el Yagis on 3.7m boom ..... $79 ea

KENWOOD

- KENWOOD PS.50 P/Supply $349
- WELZ SP-420 140-525 MHz, Watt-meter, 4/20/200W, SWR meter $129
- CORONA/JUMBO HP.240DX, 200W RF o/p 3-30 MHz, adj rx amp, 4 pos o/p. (Compare to HL-200E and save!) ..... Only $349
- PANTHER power supplies; 2A $55. 4A $69



KENWOOD TS-440S . . . $1550

Includes automatic tuner, mic. Why pay $1585? HF transceiver 100 ch memory, 100W RF o/p, SSB-CW-AM-FM, 0.15-30 MHz rx, selectivity switch, notch, IF shift, NB, etc.
Full 12 months warranty.

ICOM

- 25-1,300 MHz Discone by Icom. Only..... $199
- Kenwood TW.4100 Dual-bander coming.
- Call for Kenwood & Icom items not advertised.
- RF Power Transistors in stock; 2SC.2290 $40 ea, 2SC.2783 $69 ea, 2SC.2381 $39 ea.
- New BEARCAT/UNIDEN scanners in stock!
- 50XL 10 ch $229. 100XL 16 ch $349

ICOM IC-R7000 . . . $1799 12 months warranty

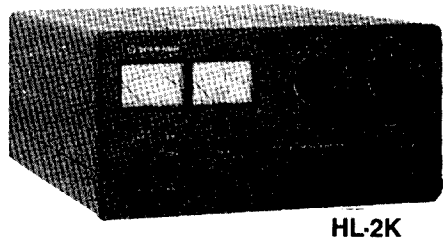
Professional HF/VHF/UHF communications receiver. Receives from 25-1000 and 1025-2000 MHz. AM, FMN, FMW, LSB and USB modes with 99 ch memory storage. Six scanning/searching modes and tuning speeds. Voice scan control skips inaudible voice frequencies. A breakthrough in receivers!

CHIRNSIDE ANTENNAS

- CHIRNSIDE CA-33 3 el tribander $379
- CHIRNSIDE CA-35DX 5 el tribander on 6m long boom, uses 2 x 10 m elements $479
- CA-5 s/s 5-band vertical, 6m long $169
- CHIRNSIDE helicals, 80-10m mono ..... $39 ea

COAXIAL CABLE

RG-213 by Benelec . . . **$2.50/m**
Why pay up to $3.90/m for RG-213?



HL-2K

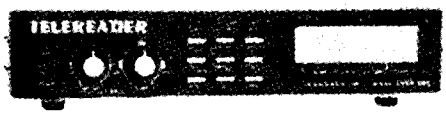
TOKYO HY-POWER LINEARS

- HL-120U 10-100W UHF GaAsFET rx $899
- HL-2K uses 2 x 3-500Zs to achieve 2 kW PEP input. 160-10m inc WARC bands, larger meters (inc RF o/p metering), 30% greater volume plate xfmr $2250

Other THP Products available on indent.
90 day warranty
Factory direct importer of high quality THP

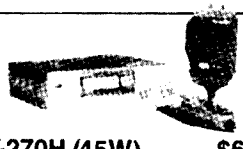
BASE STATION VERTICALS

V27/NATION BLASTER $39
Why pay up to $79 for similar verticals? 5.5m long ½-wave 10/11m vertical inc clamps.
TRADE-INS FRG-7700 w/memory $399, FTV-650B $120, FRT-7700 $39, FRV-7700 $79



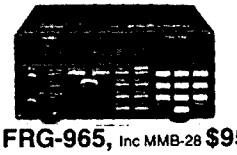
TELEREADER CWR-880 RTTY/CW TERMINAL $579

Telereader CWR-880 allows CW/BAUDOT/ASCII reception. This amazing new communications terminal features an LCD screen with 16 characters x 2 lines. TOR, ARQ, FEC, AMTOR decoded. CW random generator. 90 day warranty



FT-270H (45W) ~~$879~~ **$649**
Yaesu FT-270H 2m FM features 10 ch memory, rptr, 45/5W o/p, 0.2 uV sensitivity, PMS. Last few.

FRG-8800 ~~$1145~~ **$950**
Yaesu FRG-8800 comms receiver allows 150 kHz to 30 MHz full coverage. AM/FM/SSB/CW modes.



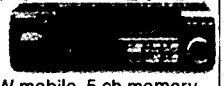
FRG-965, Inc MMB-28 ~~$1090~~ **$950**
Yaesu FRG-965 V/UHF scanning receiver covers 60-905 MHz. AM/FM/SSB. AC/DC.

Modules 70cm $460, Satell $185

FT-726R SOLD ~~$2120~~ **$1899**
Yaesu FT-726(R) SSB/FM/CW, 10W o/p, AC/DC transceiver.
inc 2m mic, DC.

KENWOOD TM-201B

$495



FM 2m 45/5W mobile, 5 ch memory transceiver. Compare to KYOKUTO and AZDEN 25W radios.
12 months warranty on our Kenwood.

ICOM IC-R71

$1199

ICOM IC-490A

UHF ALL MODE 10W MOBILE TRANSCEIVER . . . $call

Professional scanning receiver covers 25-550 and 800-1300 MHz in two continuous tuning ranges. AM/FMN/FMW, 0.3 uV AC/DC. Priority, delay, etc. Available soon. **AOR AR- 2002**

MOBILE ONE HAMTENNA

Helicals, Top Adjustable. Approx 1.7m long.

$39 each

CALL (02) 349 5792 or 344 7880 NOW!

SHOP 7, GARDEN ST, MAROUBRA JUNCTION, SYDNEY NSW

THE MAIL ORDER SPECIALISTS. Write to: P.O. BOX 33, KENSINGTON, NSW 2033

ANOTHER RAAF OLD TIMER

Type T28 Transmitter

E C Roberts VK4QI
38 Bernard Street, Rockhampton North, Qld. 4701

To continue the historical series of articles about old-time transmitters used by the Royal Australian Air Force, this month the Air Ministry Type T28 transmitter is described.

Quoting information from Group Captain E R Hall's book, *A Saga of Achievement,* the RAAF bought two of these MF transmitters from the RAF in late-1926. After constructing new transmitting stations at Richmond and Point Cook, they came into service in 1931/32. They were rated at 1.25 kW output, but from personal experience I consider this figure to be quite conservative.

Considering the date of acquisition, this transmitter was then a quite modern device, even if its specifications and operation seem strange 60 years later. One of the unique features of this transmitter was the means used to achieve an MCW type of emission; in fact this was its only mode of operation.

This transmitter was primarily intended for use in ground-air service and it served very successfully in the service until early 1942. A subsidiary service was the transmission of weather information with regular scheds on behalf of the Meteorological Bureau. Operational ranges of 600 miles (965 km), were common but were exceeded on occasion; the limiting factor being the shorter range of the aircraft transmission systems employed.

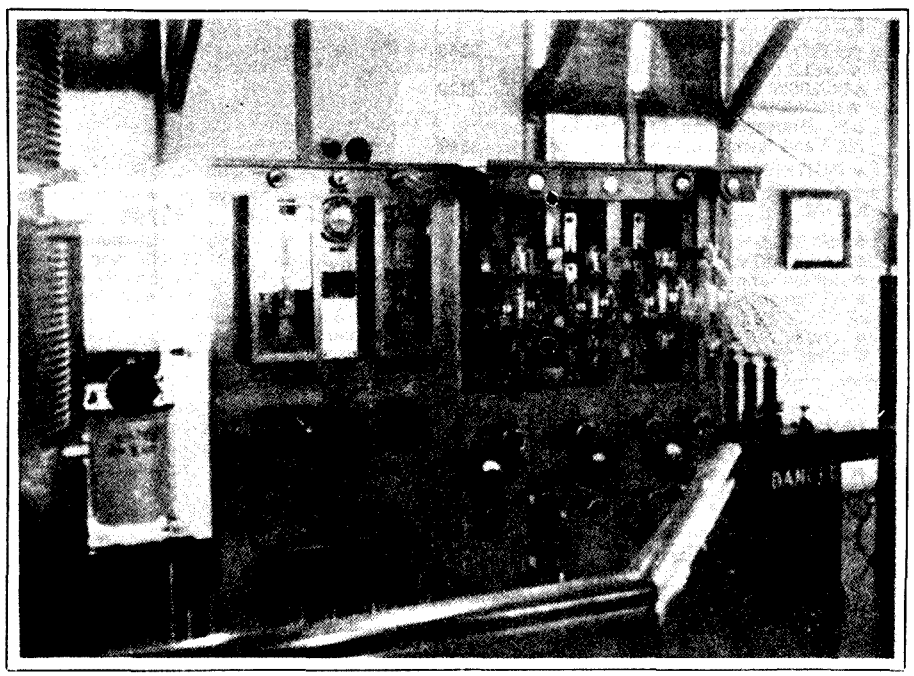
The operating frequency was 280 kHz, but the Richmond T28 was used on occasion to work an Indian RAF station on a frequency of 190 kHz. I do not know if this was an official service or just a yen on the part of the operators concerned for a bit of MF DX! If the latter, I am sure most readers will sympathise and applaud the effort!

The motor alternator unit was a beautifully constructed and balanced piece of equipment. Its design-function was to drive from 50 Hz mains, a 400 Hz single phase alternator with a nominal output voltage of 200 volts, which supplied the primary winding of the HT transformer. From personal experience, I can state that this motor alternator averaged just over 22 minutes to run down from its full operating speed of 4000 RPM to a full-stop and that is a well balanced set of rotors in anyone's language!

Quite obviously, the operating speed of the system is determined by the motor, which is powered from the 50 Hz mains, and its speed is virtually constant. I cannot recall if the motor was synchronous, but I think it was. If we vary the field voltage of the alternator, the output voltage of the alternator can be increased or decreased from the nominal 200 volts. The frequency of 400 Hz will, however, remain constant because alternator field variations can have no effect on the 50 Hz motor speed. This then gives a means of output power control of the transmitter.

The 400 Hz 200 volt alternator output was connected to the HT transformer primary. This transformer was quoted to me as having a 100:1 voltage ratio and this would, in turn, mean a nominal transmitter HT of 20 kV. Varying the alternator output voltage as previously described would, of course, alter the HT in the same primary/secondary ratio and so give quite a large degree of power control of the transmitter output.

The rectifiers were "bright emitter" types of "football" valves and rheostat controls were available to set the filament currents of the valves.

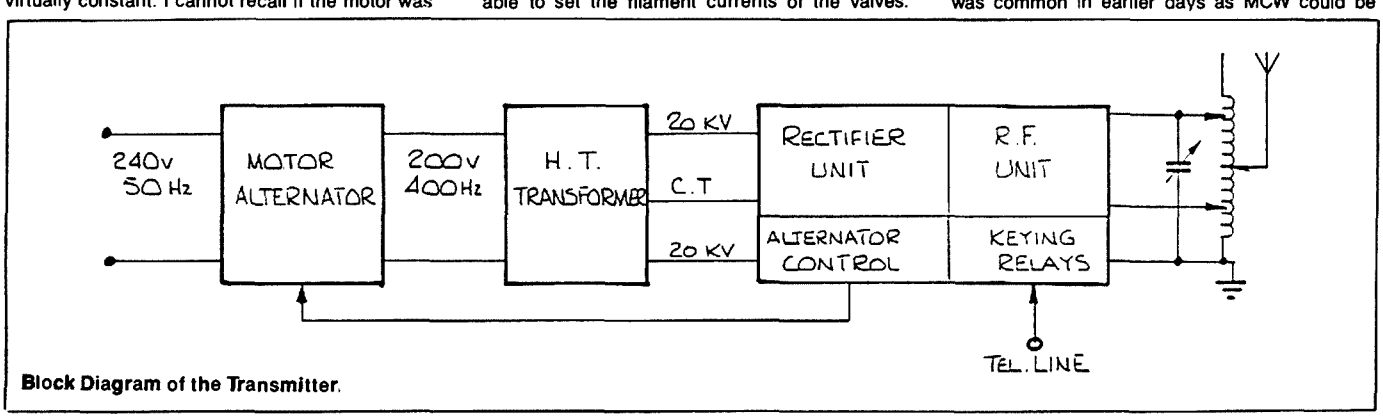


The T28 transmitter at Richmond W/T Station in 1942. The HT transformer is on the right labelled "Danger."

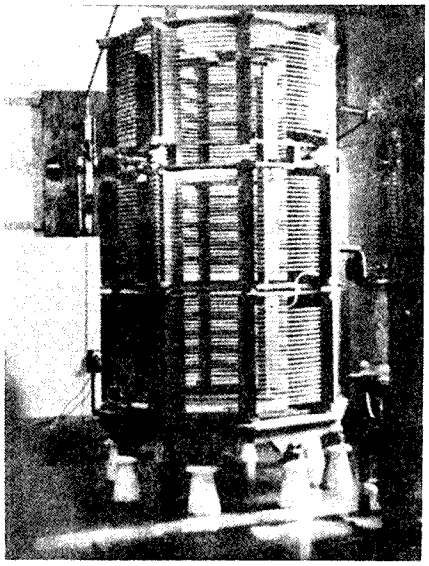
Strange to our modern ideas was the fact that *no* filtering was applied to the rectified output, so the voltage applied to the RF anodes was 800 Hz pulses from the full wave rectifiers.

The RF final consisted of two "bright emitter football" triode valves connected in parallel as an oscillator directly coupled into the aerial. These valves were again fitted with rheostat filament current controls and these could *be* used to balance the anode currents if necessary. As the HT was 800 Hz pulsed DC from the unfiltered rectifier unit, the transmission was obviously modulated at 800 Hz, although rather crudely.

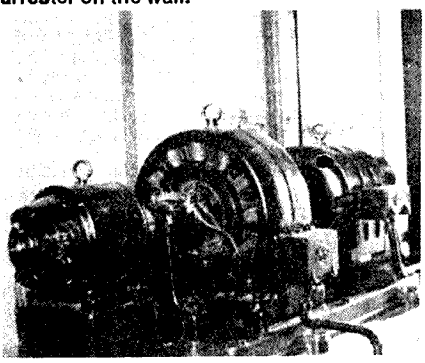
This raw 800 Hz note gave rise to a famous nickname. This technique and the use of MCW was common in earlier days as MCW could be



Block Diagram of the Transmitter.



The antenna switch and horn gap lightning arrester on the wall.



From left: The exciter, 12 pole alternator and motor.

copied on TRF receivers and regenerative receivers that mysteriously went out of oscillation or superhets when BFOs failed.

The RF coil was wound of copper tubing and was about three feet (1 metre) in diameter and about eight feet (2 metres) high. It was large enough for a person to stand inside, but strangely, it proved impossible to find any volunteers! The aerial was directly coupled to the RF coil and was a three- cage flat top of some 500 or 600 feet (152 or 182 metres) in length and was supported from two 125 feet (38 metres) high steel towers. I cannot recall the aerial current, which was substantial, but the oscillator current was normally 160 mA. At 20 kV this was an anode input power of 3.2 kW. With a rated output of 1.25 kW this gave an efficiency of less than 40 percent, but this may be considered reasonable for an oscillator coupled directly to the aerial. I have varied the transmitter power as described and oscillation ceased at approximately 2 kW input and the transmitter was still running at an input power in excess of 5 kW. I will admit it was "kind of knocking at the knees" at this power level, however.

When I was posted to Richmond W/T Station in 1942, this old transmitter had been retired and was only on strength as a standby unit. So any running experience I had of the marque was by experimenting at times when the channel was not in use or when the transmitter was fired up if the alternative transmitter was out of service. Things were not helped by the absence of any instruction manual at that time.

When the Japanese entered WWII, it became imperative to keep airborne W/T traffic to a minimum and radio silence became almost mandatory on air-ground watches. As 280 kHz was the main air-ground channel from Richmond at that time, a procedure of sending a 15 second dash from the ground station each 10 or 15 minutes was introduced to wake aircraft operators up and enable D/F bearings to be taken from aircraft where this facility was installed.

Unfortunately, the poor old T28 just was not up to this sort of treatment, as the oscillator anodes would quickly blush, go white hot and then glisten as they were on the verge of melting. Therefore, a newer type of transmitter was used for this service and the poor old veteran was held as a standby at much reduced ratings.

Finally, after many successful years of service, the raucous notes of the T28 faded from the service scene.

ar

Try This!

CAN'T HEAR THE MONITOR?

Eric Smith VK3CES
Fairy Dell Road, Monbulk, Vic. 3793

Tests made with operators on the* Early Bird Net *have shown this idea to be effective.

Owners of the Yaesu FT-7 (and other similar rigs), when operating CW, cannot hear the monitor when the key is closed in the receive mode. Pressing the key turns on the transmitter in a type of fixed and unalterable VOX situation.

This makes it difficult to net accurately and, in net operation in particular, can be a source of frustration and nuisance.

The solution is simple. A buzzer, pitch-pipe, oscillator or any other device which can be accurately tuned to the same note as the rig's monitor (usually in the vicinity of 700 to 800 Hz) is all that is necessary.

When a station is heard, the oscillator, or whatever, is switched on and the incoming signal is then tuned to unison with the oscillator note. When the key is depressed it will be found that the rig is "netted."

Accuracy depends on the ability of the operator to produce unisons, firstly in setting the oscillator frequency and secondly in matching the incoming signal to the oscillator note.

Desirable features in an oscillator used for this purpose would be firstly a fixed frequency (pitch) and a volume control so that weak signals would not be swamped.

ar

PRECISE TIME COMPARISONS

For over 15 years the ABC terrestrial television network has been used with outstanding success for precise time comparisons in Eastern and Central Australia. This has enabled clocks and frequency standards to be compared with each other with submicrosecond accuracy and better than 100 nanosecond precision on a daily basis.

The method has depended on the television synchronising pulses originating from the ABC Gore Hill (Sydney) studio which were transmitted over stable terrestrial bearers to cities and towns around Australia — users measured the time of arrival of a particular sync pulse according to their own clocks, and exchanged measurements amongst themselves to determine the relative phases of the clocks.

Delays in the bearers were calibrated occasionally by carrying a portable caesium standard between users to establish relationships between the clocks directly.

In May 1986, this technique ceased to be viable in general between cities and towns because of the progressive introduction of *FEDLOCK* frame store at local television transmitters, which puts arbitrary variable delays into the total network, and because of the use of *AUSSAT* to transfer programs to local stations.

A composite system is now being introduced, using the Global Positioning System (GPS) of satellites for comparisons between a few major laboratories, ABC television from *AUSSAT* to link with other places in the South- East beam, and local terrestrial television within cities.

Initially, this system will link clocks within *AUSSAT's* South- Eastern footprint, while full national coverage may eventuate using the national beam.

GPS receivers have been in use since July 1983 to give daily comparisons of the clocks linked by television against the Master Clock at the US Naval Observatory (USNO) in Washington, DC.

As a result, a selection of Australian clocks have been, since mid-1984, contributing to the formation of Co-ordinated Universal Time (UTC) by the Bureau International de l'Heure (BIH) in Paris.

NEW TIME SCHEDULE

From May 19, 1986, the time for taking television measurements changed. The new schedule is:

TIME (UT)	SIGNAL MEASURED
0^h00^m	ABC from AUSSAT
0^h01^m	ABC terrestrial
0^h02^m	Channel 9 terrestrial

These times are in Universal Time (GMT) and correspond to 10 am Australian Eastern Standard Time, or 11 am Australian Eastern Daylight Saving Time.

The schedule change was decided upon by the National Standards Commission (NSC) Working Group on Precise Time Comparisons, and takes advantage of the changes in the television method to bring the schedule into line with standard international practice.

TERRESTRIAL TELEVISION

Within cities and areas served by a common television transmitter local television will continue to be used. The terrestrial ABC television links between Melbourne and towns in Victoria and Tasmania are expected to remain, and Telecom Australia Research Laboratories in Melbourne plan to invoke the terrestrial SBS network for a link to Adelaide. Channel 9 may also continue to be used for some time yet. This enables all clocks in the city to join the Australian time network if there is also a GPS or AUSSAT receiver in the same locality.

AUSSAT TELEVISION

The first Australian national domestic satellite is now broadcasting television programs continuously to each footprint, and HACBSS receive-only earth stations with 1.5 metre antenna are readily available commercially.

Experiments at CSIRO National Measurements Laboratory (NML) in Sydney using a 1.8 metre antenna on the South-East beam, 180 degrees K low noise amplifier, commercial B-MAC decoder and the 'traditional' television sync pulse selector have demonstrated ease of operation and insignificant jitter in time-interval measurements. The daily pattern of range variations due to the satellite's orbital characteristics is readily observed.

Similar experiments at Natmap's Orroral observatory using an all-commercial 1.5 metre earth station have confirmed the NML findings.

NML will monitor the daily range variations between the satellite and the NML antenna, and simultaneously do traditional terrestrial measurements on the Gore Hill transmissions. For earth stations at remote known locations within the SE footprint, 2-5 microseconds accuracy time comparisons can be achieved provided the satellite remains within its specified orbital bounds.

Within a few months, it is expected that several of the places with GPS receivers will also be equipped with AUSSAT earth stations. Normal measurements of the time of arrival of a common television sync pulse from AUSSAT at these 'base stations' will enable calculations of the satellite's position with sufficient accuracy to achieve time comparisons to other stations at known locations which are equipped only with a clock and a commercial HACBSS receive-only earth station.

Given four GPS/AUSSAT stations equally spaced around the perimeter of a region; eg South-East beam footprint, and with calibration of receiver delays, time transfer accuracy within the region would be limited by measurement jitter and differential propagation media effects. Even with non-optimum configurations, 100 nanosecond accuracy generally is anticipated. It is planned to establish a service which will be available anywhere within the region.

GLOBAL POSITIONING SYSTEM (GPS)

At present there are seven useful GPS space vehicles in 12-hour orbits, and time comparisons against the USNO Master Clock can be made several times daily with accuracy approaching 50 nanoseconds from almost anywhere in the world.

When the full constellation is available, by about 1990, its 18 satellites will provide virtually continuous coverage anywhere. Preliminary results are given in real time and it has proven extremely reliable so far.

The NSC Working Group recommended in 1985 that comparisons be made using GPS wherever possible.

At present, units are known to be operating in Sydney, Melbourne, ACT (2), Alice Springs, Yarragadee WA, and possibly Adelaide. However, commercial receivers ("Time Transfer Units") cost over $A30 000, a price difficult to justify by many users of precise time.

Hence, the current network consists of high precision common-view GPS time transfer links between Sydney, Canberra and Melbourne, and local television comparisons within these cities.

The use of AUSSAT is designed to extend this network, at moderate cost.

DATA CO-ORDINATION

Daily television measurements made at NML, Telecom, and the Division of National Mapping (Natmap) are sent to users on a weekly basis to enable the effects of television transmission time and propagation delay to be removed from the users' readings. Also, all interested users send their television and GPS measurements to Natmap.

These are used to form the 'mean time scale' Co-ordinated Universal Time in Australia (UTC(AUS)) which provides a common reference and relates individual clocks to international time scales. The time scale results are published each month. Natmap is making provisions to incorporate AUSSAT television measurements into the time scale and to calculate the effects of AUSSAT's range variations.

FUTURE IMPROVEMENTS

The national beam holds promise for providing a truly national time comparison service. The principal problems to be studied are antenna size needed, geographical distribution of base stations and propagation media effects.

The methods described above require exchange of information between users and a certain amount of post-processing to obtain final results. NML is looking at possibilities for impressing a timing signal on AUSSAT transmissions in such a way that the signal is 'on time' at a defined location. This would provide an adequate 'real time' service for many users within the satellite footprint.

Exchange of data is at present accomplished by letter, telex and the GE Mark III Time-share system.

The growth of digital data services provided by Telecom, AUSSAT and others should lead to improvements in speed, efficiency and availability. The Working Group is studying these with a view to recommending an inexpensive method.

APPLICATIONS

The changes to the schedule and the introduction of new methods of precise time comparison are responses to the needs, largely by standards and calibration laboratories and astronomical observatories, to maintain precise standards of time and frequency and to ensure the accuracy of their relationships to international time scales and the SI second.

These needs were clearly demonstrated at the IREE Conference on Precise Time and Frequency in Canberra in August 1980, and at the NSC Technical Workshop on Precise Time Comparisons in Sydney in February 1984. The services now in place and under development will provide adequate timing references, conveniently and at low cost, to users in South-East Australia and, shortly, in the whole country and even beyond.

Special interest in such a system has been shown by electricity authorities, geodetic surveying organisations, exploration companies and the digital communications industry. It is believed that all these and many more will benefit from the services provided.

Acknowledgments

The users are most appreciative of special arrangements made by the ABC during the FEDLOCK phase-in over the last two years. AUSSAT Pty Ltd has provided much useful information.

For further information or suggestions please contact:

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Dr L McK Luck, Division of National Mapping, PO Box 31, Belconnen, ACT. 2626 (062) 52 5172 or 35 7285.

Mr R W Harris, Telecom Australia Research Laboratories, PO Box 249, Clayton, Vic. 3168 (03) 541 5124.

Dr G Harvey, National Standards Commission, PO Box 282, North Ryde, NSW. 2113 (02) 888 3922.

—Reprinted courtesy *IREE Monitor*, August 1986 from a paper from the National Standards Commission

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SECOND ADELAIDE SCOUTS, VK5BPA & AMATEUR RADIO

Peter Koen
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2nd Adelaide Scout Amateur Radio Club
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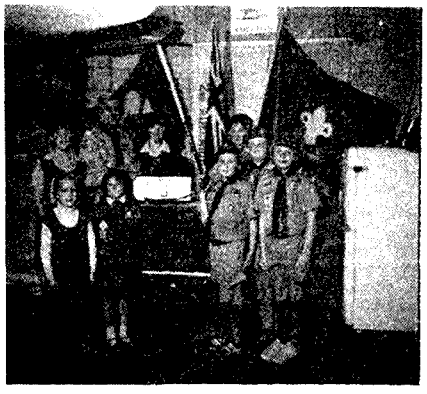
A diary of the growth of a radio club and JOTA, with the co-operation of friendly amateurs.



Bob VK5ADR, Club Leader, with the 2nd Adelaide Cub Scouts and Scouts and 1st Torrens Park Brownies and Guides. From left: Sonja, Jane Melanie, Katrina, David (with mic), Nick, Adam and Tony.

Our first Jamboree on the Air (JOTA) was in 1979. With the help of Mike Hart VK5NNN (Mike now lives in VK3 with fishing his number one interest) and Bob Murphy VK5MM, who helped tune the first antenna — an inverted Vee dipole. Seven contacts were made and 25 Scouts, Leaders and Parents visited the shack.

1980 was a BIG year. In May, Bob Dodd passed the NAOCP examinations and received the call sign VK5NFU. July saw the arrival and erection of a rural- type windmill tower from Dennis Myers. This tower then supported inverted Vee antennas for 80, 40, 15 and 10 metres and a two metre J-pole.

Amateur station VK5BPA was granted a licence on July 31, with Bob VK5NFU as Club Leader. August 20, the Club purchased an FTDX 401, and on October 13, it became affiliated with the WIA (SA) Division. During November, Bob upgraded from VK5NFU to VK5ADR and December 5, saw the first monthly meeting of the Club with Bob the only attendee. (Attendances improved with 12 present for one meeting!). Definitely a memorable year.

For JOTA 1980, 89 people visited the shack, including the Club's own Scouts, and two Brownie Packs. It was a time that will be long remembered as the JOTA when the shack was filled with Brownies and there was no one on air for them to talk to!

The shack was a meeting room in the Scout Hall with a special desk and notice board for the few OSL cards which were received. That JOTA would not have been possible without the help of Mike VK5NNN/ZMH, Rod VK5AN, Leith VK5QH and Les VK5ZW, all of whom donated their time, enthusiasm and expertise for the weekend.

On September 13, 1981 a home-brew antenna, faithfully constructed by Bob VK5ADR, was mounted on the tower and Les VK5ZW, loaned his rotator for JOTA 1981.

Early 1982, saw the purchase of two, two metre rigs and the removal of an ex-Telecom RAX hut to the rear of the Scout Hall. For JOTA 1982, Rod VK5AN set-up a RTTY station as well as the usual communications equipment.

The first meeting in the new shack was held on July 2, 1983 with Don McDonald VK5ADD, Assistant Commissioner for Scout Radio Activities, Adrian Snell VK5ZSN, and some Scouts present. During December a two metre RTTY modem and Model 100 were put into service.

On October 10, 1984 an 11.5 metre (38 foot) pole was erected next to the shack to accommodate ATV, UHF and two five-eighth two metre antennas. Thanks to Rod VK5AN, Don VK5ADD and Craig VK5ZAW for their assistance with this project. (A dipole antenna was later also transferred to the pole).

On May 17, 1985 the Club were honoured to use the WIA 75th Anniversary call sign, VK75A. In August, the Scout Patrols built a flashing LED project and in October the Club bought a three-element beam. Bob VK5AZ donated a rotator and Colin VK5KCR a teletype terminal. Adrian VK5ZSN, later donated a CRO for the RTTY.

Since the Club's first participation in JOTA, 317 young people have taken part and an enjoyable time was also spent during JOTA this year.

The Club has operated from many portable locations since its Inception, usually where member Scouts are camped. The Club has also been involved in many activities with the WIA (SA) Division during South Australia's 150th Anniversary.

Club activities involve many nights in the shack with the member Scouts and Guides as well as visiting Scouts and Guides from neighbouring districts. Each year the Club participates in the John Moyle Memorial Field Day and the Remembrance Day Contests.

The next electronics project planned for the Scouts is the construction of a CW oscillator.

Planning is well under way for VK5BP, the South Australian Scout Association station, to be on air for the 10th Australian (world invitational) Rover Moot which will be held at Woodhouse, Stirling in the Adelaide Hills from December 28, 1986 to January 8, 1987.

The 15th Australian Jamboree will be held at Woodhouse during Christmas/New Year, 1988-89, and planning has commenced for VK5BP to be operational at the site.

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Report on the FTAC Band Plan Paper

Peter Gamble VK3YRP
Chairman, FTAC

The preparation and issuing of Band Plans was discussed at the 1985 Federal Convention. As a result, the following resolution was passed:

"That the Federal Executive develop, co-ordinate and publicise principles and procedures for the annual review of Australian Frequency Band Plans by Council. These should ensure that there is the maximum possible involvement of Divisions and adequate co-ordination of views of users of all authorised modes prior to the Convention."

To assist this process, the Federal Technical Advisory Committee (FTAC) documented the existing Band Plans. These were the subject of a series of articles in AR earlier this year. "Band Planning" introduced the general subject in January 1986 AR, and was followed by "Band Planning for the High Frequency Bands" in February, and "Band Planning for the VHF and UHF Bands" in April. Existing Band Planning information was researched by the Committee and formed the basis of a paper "Band Plans for the Amateur Radio Service." To this was added material from a variety of Department of Communications (DOC) sources.

Following comments from a number of amateurs, amendments were made to the paper, which was then printed and circulated for discussion at the 1986 Federal Convention. A brief presentation was made on the highlights of the paper by the Chairman of FTAC. Following extensive discussions, both in the formal Convention sessions and during "meal" and other breaks, the paper was adopted with some minor modifications.

The Band Plan paper consists of an introduction, followed by some comments on spectrum management and gentlemen's agreements. A section on Band Planning Philosophies lists six principles for successful Band Plans:

- Accord with International band usage
- Consider all users
- Spectrum must be allocated according to mode requirements and usage
- The Band Plan must be dynamic yet evolutionary
- The Band Plan must include forward thinking
- The Band Plan must be promulgated to all users

DEFINITIONS

An explanation of the "Layered Band Plan" (see February AR, page 20), is followed by the definitions that apply to modulation mode and bandwidth. The following definitions have been accepted for the Amateur Radio Service in Australia:

1 'CW' designates Telegraphy (Morse) with a maximum band width of 200 Hz (200HA1A/A1B)
2 'Narrow Band' designates Narrow Band modes (other than CW) occupying bandwidths less than 1.12 kHz. Narrow band modes use an appropriate modulation technique and speed to stay within the designated bandwidth. Narrow band modes include ASCII, RTTY, AMTOR, and Packet Radio.
3 'Wide Band' designates Wide Band modes occupying bandwidths greater than 1.12 kHz. On bands below 50 MHz the occupied bandwidth is limited to less than 6 kHz (except for AM or A3A which may occupy a bandwidth of up to 8 kHz). On bands above 50 MHz the restrictions on bandwidth are those specified in the ITU Radio Regulations with the proviso that the occupied bandwidth shall not extend beyond the limits of the band being used. Wide band modes include SSB, NBFM, FAX, SSTV, and Data Transmission at greater than 300 Baud. It also includes ATV on bands above 420 MHz.

These definitions were used throughout the remainder of the paper.

The term "exclusive allocation" has been used previously to indicate a single allocation to the amateur service within Australia. However, the correct term is "primary service." Some amateur band segments (and even some complete bands) have the status of "secondary service." Stations of the secondary service shall not cause harmful interference to stations of the primary service. It should be noted that the use of the terms "primary" and "secondary" service in the following Band Plans refers only to the status of the allocation within Australia and does not cover assignments which may be made in other countries to other services. The 7.000-7.100 MHz segment allocated overseas to broadcast stations is an illustrative example.

Then follows the Band Plan for each amateur band from 1.8-1240 MHz. Each Band Plan consists of a preamble describing the general allocation and any requirements that have to be taken into account in allocating frequencies for specific uses. This is followed by a description of the frequency segments that have been allocated to specific uses and any necessary footnotes to describe the reasons for a particular allocation. A graphical presentation of this information is also included in the Band Plan. Also included is the status of each amateur band as indicated in the Australian Table of Frequency Allocations, together with other relevant information on band usage.

CONCLUSION

The paper concluded with the following conclusion and recommendations:

> "The Wireless Institute believes that the present approach by the Department of Communications in allowing the Amateur Service to develop its own Band Plans is the correct approach. Further, the resolution passed at the 1985 Federal Convention and quoted in the first paragraph of this paper is the most appropriate way of developing and approving Band Plans.
> Accordingly, the following recommendations are made:
> 1 That the revised definitions given in Section 6 of this paper be approved.
> 2 That the Band Plans contained in Section 7 of this paper be approved as the official WIA Band Plans."

COMMENTS AND DISCUSSION

The paper was discussed at the Convention on a band by band basis. Some minor amendments were made to the plans for the 7 and 50 MHz bands (see later) and the above two recommendations were then accepted by the Convention. Further work has since been carried out on the drawings and the revised drawings are published in the 1986 issue of the *Call Book*.

It was not FTAC's original intention to modify the existing Band Plans in any way prior to the Convention. However, considerable representations were received on the 1.8 MHz Band Plan, which indicated that it did not conform to current usage. As this had both international and national implications, this plan was revised accordingly.

Other comments have also been received in response to the AR articles. Some of the comments were incorporated in the issue of the paper discussed at the Convention. Unfortunately, it was not possible to individually answer all of the comments received.

At the Convention a number of minor adjustments were made to the plans as originally published in AR. The revised details are as follows:

1. 1.8 MHz Band (160 metres)
A change was made to the Narrow Band and Wide Band segments. The Narrow Band segment now occupies 1.810 to 1.815 MHz, while the Wide Band segment occupies 1.815 to 1.875 MHz. Further, the existence of a "DX Window" between 1.815 MHz and 1.835 MHz was noted. (See Figure 1).

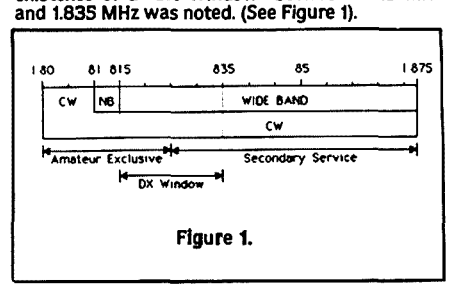

Figure 1.

2. 7 MHz Band (40 metres)
A minor change was made to the Narrow Band (and consequently the Wide Band) segments. The Narrow Band segment now occupies 7.030 to 7.050 MHz, while the Wide Band segment now occupies 7.050 to 7.300 MHz. This was to allow an overlap with the Region 1 Narrow Band Segment. (See Figure 2).

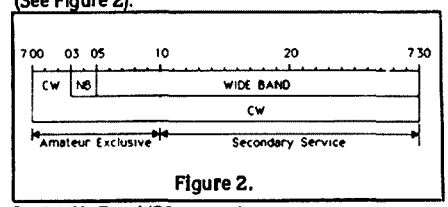

Figure 2.

3. 10 MHz Band (30 metres)
A minor addition was made to the notes accompanying this Band Plan. The complete notes are as follows:

> "The Australian authorities permit Wide Band modes in this narrow amateur allocation and Australian amateurs have seen fit to utilise this privilege, for it is a useful band for interstate contacts as well as DX. The recommended usage for Wide Band modes is within Australia only, but the amateur community may wish to establish a gentleman's agreement to not use Wide Band modes (phone) at all. Note that the Narrow Band overlay completely aligns with the Region 1 RTTY segment.
> "Region 3 have opted to permit only CW and Narrow Band operations across the full band allocation. The use of Wide Band modes should, therefore, be restricted to communication within the VK call areas only. Further, only the minimum power necessary to reliably maintain Wide Band contacts should be used."

4. 50 MHz Band (6 metres)
Currently, an FM channel spacing of 25 kHz with a repeater offset of 600 kHz has been defined for this band. However, it has been proposed (and accepted at the Convention) that the repeater offset be changed to 1 MHz, with the repeater input frequencies to now be from 52.600 to 53.000 MHz and the repeater output frequencies unchanged. The interval 53.000 to 53.400 MHz would revert to general use for Wide Band modes. A transition period has been allowed for this change to take place. More details will be published on this later.

Some discussion took place on the 420 MHz band (70 cm) following the appearance of various radio-location services in the 420 to 430 MHz segment. No changes were proposed at the moment, however, the matter is to be kept under review, as is the status of the 576 MHz band (50 cm).

A considerable amount of discussion took place on the Band Plan for the 1240 MHz band (23 cm).

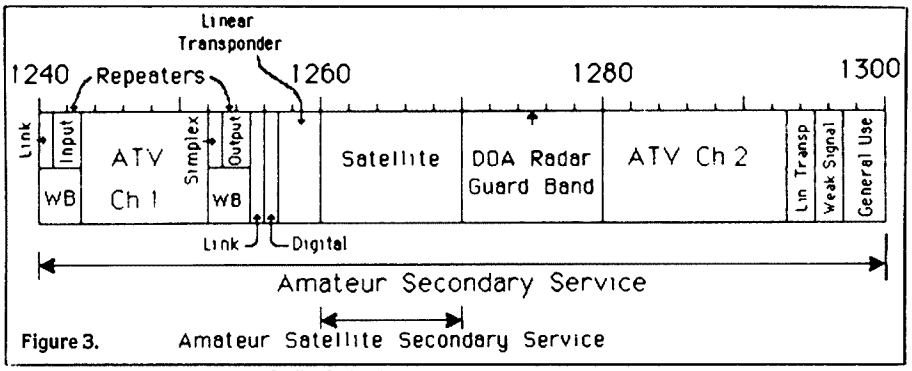

Figure 3.

However, after consideration of all of the issues involved, the Band Plan approved at the 1985 Federal Convention was endorsed. (See Figure 3).

CURRENT ACTIVITY

Since the Convention, the use of the 28 MHz band (10 metres) for FM repeaters has been proposed to the Department of Communications. The arrangements proposed were to use the US standard of 20 kHz channel spacing and a repeater offset of 100 kHz. Repeater input frequencies are from 29.520 to 29.580 MHz and a deviation of 5 kHz is used. Verbal approval-in-principle has been given be the Department for this type of operation, including the use of 5 kHz deviation (16K0F3E). (Note: this will require a minor amendment to the Wide Band definition!). However, there is an indication that the US is considering a change to a repeater offset of 400 kHz. Repeater outputs would be from 29.500 to 29.680 MHz, with repeater inputs moved to 29.100 to 29.280 MHz. This matter is currently being followed up with the US.

The change from a 600 kHz offset to a 1 MHz offset on the 50 MHz band is being followed up with the Department of Communications.

As can be seen, amateur radio Band Plans are not a static thing! Copies of the complete paper are available from the Federal Office or from your Divisions Federal Councillor.

I would like to thank all of the amateurs who contributed to this paper, both during the initial drafting and as a response to the printing of the earlier material in *Amateur Radio*. As a result of the wide ranging discussions that had been held right around Australia on this topic, the Federal Councillors were well briefed when they arrived in Melbourne for the 1986 Convention.

REFERENCES:

1. "The Australian Table of Frequency Allocations" (ATFA), published by the Department of Communications, October 1982 Edition.
2. The Region 3 Band Plans, (agreed in Auckland, November 1985) and reported in *Amateur Radio*, February 1986 issue.
3. The Region 1 and UK Band Plans, reported in *RadCom*, January 1986 issue.
4. The "Revised Amateur Operators Handbook," draft of chapter 5 issued by the Department of Communications, February 1986.
5. The "ARRL Repeater Directory, 1986-87 Edition," published by the ARRL.
6. "Band Plans for the Amateur Radio Service," Issue 2.0, dated July 10, 1986.

Equipment Review

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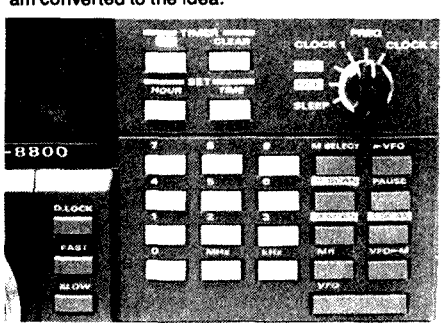
3 Fairview Avenue, Glen Waverley, Vic. 3150

YAESU FRG-8800 RECEIVER

The Yaesu name has, over the last few years, been synonymous with well-designed general coverage communications receivers. Starting with the famous FRG-7, the first really satisfactory, popular- priced receiver. Then the FRG-7000, which featured a digital frequency and clock readout. The FRG-7700, simplified operation by eliminating the preselector tuning, and the the FRG-8800 which has been updated with keypad frequency entry and a multi-function LCD display. The FRG-8800 has been on the local market now for nearly two years and, while this review is perhaps somewhat late, it has given us time to take an extended look at this interesting receiver.

Firstly, let's take a closer look at the 8800 and see what it has to offer, both to the amateur radio operator and the keen shortwave listener.

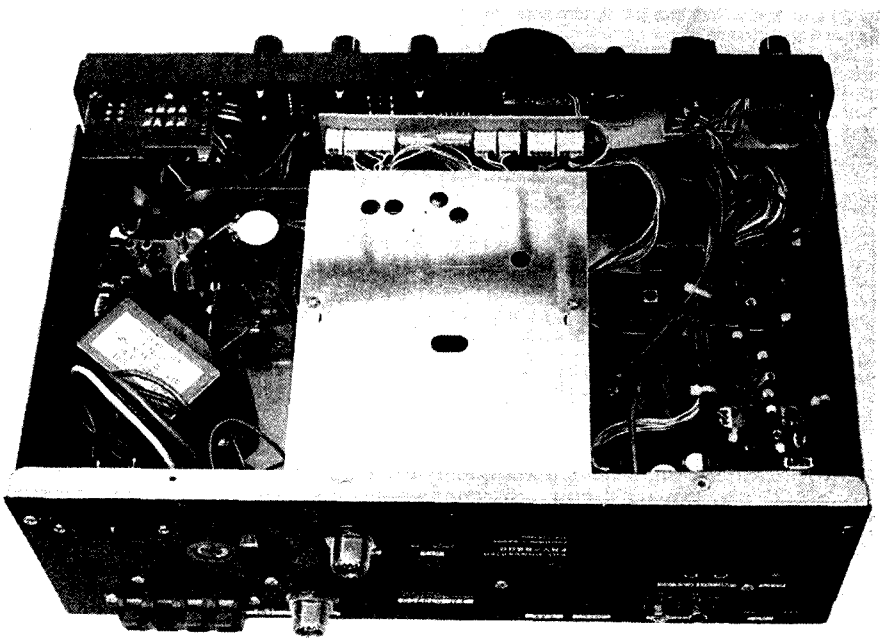
On first inspection the new LCD display is the feature that makes the greatest impact. It combines the frequency readout, S-meter, mode indicator, selectivity status, memory channel number and scan mode selected. I have to admit that the thought of an LCD bar-graph S-meter did not impress me initially, but after extended use of it I am converted to the idea.



Keypad.

The 20 button keypad is used to directly select any frequency within the tuning range, which in the case of this review receiver with the optional VHF converter, covered from 150 kHz to 29.999 MHz and 116 to 173.999 MHz.

All modes are built-in as standard and they include AM, SSB (upper and lower), CW and FM.



Bottom view — the VHF converter (centre) is optional.

With the optional VHF converter the FM mode is especially useful for the two metre amateur band.

Two, 24-hour clock modes can be selected in place of the frequency readout and these can be arranged to switch the receiver on and off at pre-programmed times. External clock switching will also operate auxiliary equipment such as tape recorders.

The general presentation of the receiver is good. All controls are well spaced out and of reasonable size. The forward facing speaker produces excellent audio quality. The memory system enables frequency mode and selectivity selection to be retained. However, it seems odd that Yaesu did not provide a Lithium battery system to retain this information. Instead, three AA pen light cells are fitted into a rear panel container. As long as the receiver is connected to an AC power point, there is no drain on these batteries, but should the AC supply be removed the drain on them is quite high and the life of them is rather short. Just why Yaesu did not Install a Lithium is known only to themf

Rear Panel.

I must say that I did enjoy using the VHF coverage. The sensitivity on the two metre band was quite comparable to most of the current transceivers for that band. Coverage also includes the aircraft band, so you can listen into the action from your local airport.

A dual width noise blanker is fitted. Unfortunately, the width selection switch is located on the rear panel, when there is plenty of room for its inclusion on the front panel between the NAR/WIDE and AGC switch. In spite of this, the blanker works quite well with the wide position being reasonably effective with the Woodpecker and troublesome power line noise. The narrow position is most effective against car ignition noise, although I find that car ignition is not the problem it used to be. Most cars seem to be very well suppressed these days.

Three types of frequency scanning are built into the 8800. These are memory scan in which each of the 12 memories are selected in turn. The scan pauses for about half a second on each channel and can be stopped and started by pushing the pause button.

The second is a selective memory scan in which preselected memories-only are scanned, and thirdly, the programmed band scan. Scan limits are programmed into the memories and the scanning rate can be changed by selecting either the fast or slow tuning rates.

In the manual tuning mode, the two selectable tuning rates are well chosen. The slow tuning rate is at about six kilohertz per turn of the tuning knob. In the fast rate, 125 kHz are covered per knob revolution. In view of this, it is a little hard to know why Yaesu have added a fine tuning control. I did not find any practical use for it at all.

With the exception of the FRV-8800, all of the other options are remnants from the earlier FRG-7700 receiver. In saying this, I do not mean to infer that these are in any way inferior. It just seems odd that Yaesu did not at least up-date the identification numbers. Anyway, they are the external VHF converter, the FRV7700 which covers three bands, including the six, and two metre amateur bands, and the aircraft band. The FRT7700 antenna tuner and the FRA-7700 active antenna.

I have not had the opportunity to try any of these so of course cannot comment on their performance.

Frequency selection via the keypad is a little unusual. Both the megahertz and kilohertz can be selected independently. As an example, press 21 and it will appear in the kilohertz section of the display, but pressing the orange megahertz button transfers this to the megahertz section of the display and the receiver is now tuned to 21 MHz. It is easy once you get used to it! The same system works if a change of, say several hundred kilohertz are required.

All controls operate in a smooth manner, especially the main tuning control, which is a delight to use. The attenuator control is actually an IF gain which produces a smooth progressive action. The squelch will be most used with the VHF converter for FM reception and the tone control produced a progressive top-cut in the audio output quality.

The least liked feature was the flip-down legs at the front of the receiver. They did not lift the front high enough and had an annoying tendency to flip-down unexpectedly! A chrome wire bale would be a big improvement.

FRG-8800 UNDER TEST

The following test equipment was used to produce our figures.

A Marconi TF-995A/5 RF signal generator; AWA F-242A noise and distortion meter; and a Daven audio power output meter.

Firstly, the audio power output of the receiver was checked with the following results:

8 ohm load	1.0 watt	1.3 percent distortion
	1.5 watts	10.0 percent distortion
	2.0 watts	32.0 percent distortion
4 ohm load	1.5 watts	8 percent distortion

These figures were taken in the SSB mode with a 1 kHz beat-note to also indicate the product detector distortion which is quite good. However, the maximum audio power output is rather low.

Distortion in the AM mode was next measured and found to be four percent at 30 percent modulation with a 1 kHz tone.

Distortion with FM mode selected and the generator set at 3 kHz deviation with a 1 kHz tone was measured at two percent.

With the audio gain control at zero, noise output from the receiver was measured at -60 dBm, a very creditable figure.

Next the audio response for AM reception was checked. This was measured in the normal AM selectivity mode. It is possible to select the narrow SSB selectivity for AM reception.

Frequency	60	80	100	200	500	1k
Response	-10	-7	-5	-2	-.5	0
Frequency	1.5k	2k	2.5k	3k	4k	4.5k
Response	-1	-3	-7	-9	-11	-13 dB

This shows that the AM bandwidth is rather wide for serious shortwave DXing. Unfortunately, no optional high grade filters are offered as options.

The audio response was checked for SSB reception.

Frequency	200	500	1k	1.5k	2k	2.5k
Response	-10	-.5	0	-.5	-1	-4
Frequency	3k	3.5k				
Response	-8	-15	dB			

This again shows that the selectivity is rather wide.

Sensitivity was checked in the SSB mode at several frequencies.

At 14 MHz	1.0 µV	23 dB s/n
	.1 µV	6 dB s/n
At 146 MHz	1.0 µV	25 dB Sinad
	.5 µV	15 dB Sinad.

The calibration of the LCD 'S' meter was checked at 14.200 MHz.

S-meter reading	S3	S5	S7	S9	+20	+40	+60
Signal generator output	2.5	5	10	25	100 µV	1 mV	10 mV

The S-meter is also calibrated in the widely used SINPO scale of one to five. This is used by shortwave broadcast listeners.

INSTRUCTION BOOK

The owners manual for the receiver is excellent from the point- of-view for operating and setting up the equipment. However, it contains only limited technical information. There is no circuit diagram or even a block layout.

However, let us look at the positive side of the book. Control functions are covered in detail. There is a short discussion on suitable antennas for both HF and VHF reception, but unfortunately, only dipoles receive recommendation. Quads and Yagis are dismissed as being narrow band devices, although a log-periodic array is okay if you can afford one.

It is a pity that some wide band antennas are not described.

Several pages are devoted to the optional computer control of the receiver — it will be interesting to see how many listeners take advantage of this facility.

CONCLUSION

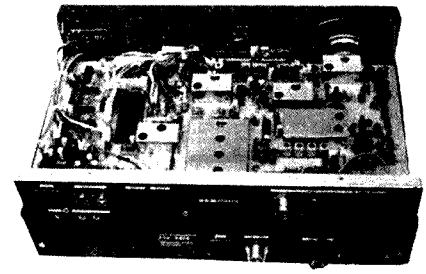
There is no doubt that this receiver is by far the best from the Yaesu factory so far. Perhaps the 12 memories are a little on the light side and certainly well down on the Icom 32 and Kenwood 100.

Selectivity is certainly on the wide side and it is unfortunate that better filters are not offered as options. (In the United Kingdom, upgraded receivers are offered at premium prices by Surry Electronics).

For all of that, the receiver is very easy to operate and, with the optional VHF converter, offers facilities not easily obtained in any other receiver.

If you are looking for a general coverage receiver for shortwave listening, or as an auxiliary set for the shack, the FRG-8800 would have to be seriously considered.

This review receiver was supplied by Dick Smith Electronics, to whom all inquiries should be directed.



Internal View from Top.

QSP

AMATEUR OPERATOR'S HANDBOOK

It is planned to produce the new operator's handbook in brochure format. The book will comprise three separate brochures — one covering Regulatory and Licensing Conditions, another on Syllabuses and Certificates, and the last on Procedures and Guidelines.

The Department of Communications aims to have the brochures available by the end of this year.

NEW!

GENERAL COVERAGE RECEIVER

THE JRC NRD525

The enthusiastic shortwave listener knows all too well the excellent performance of the NRD505 and NRD515 general coverage receivers from the JAPAN RADIO COMPANY. Building on the experience gained from the production of these outstanding receivers, JRC introduce a new model, the NRD525 combining advanced performance with the first class construction of the NRD505.

R-5000

For The Connoisseur in SWL

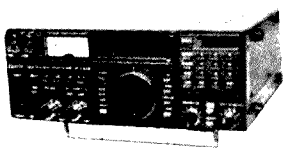
R-5000 COMMUNICATIONS RECEIVER

The R-5000 is a new competition grade communications receiver which incorporates every conceivable operating feature. Designed for all modes of reception (SSB, CW, AM, FM, FSK), the R-5000 covers the frequency range from 100 kHz to 30 MHz, and with the addition of the optional VC-20 VHF converter, will also cover the 108 to 174 MHz range, again with all mode reception. The R-5000 has been designed with high performance in mind, and has an excellent dynamic range, together with carefully chosen operating facilities to match today's conditions. Microprocessor control is used for main functions, including dual digital VFOs, 100 memory channels, memory scrolling, memory and programmable band scan, and many other facilities.

R-71A

COMMERCIAL RECEIVER

PRIDE OF ICOM



ICOM introduces the IC-R71A 100 kHz to 30 MHz superior-grade general coverage receiver with innovative features including keyboard frequency entry and wireless remote control (optional). This easy-to-use and versatile receiver is ideal for anyone wanting to listen in to world-wide communications. Demanding no previous shortwave receiver experience, the IC- R71A will accommodate an SWL (shortwave listener), Ham (amateur radio operator), maritime operator or commercial operator.

NEW!

IC-R7000

ICOM 25-1000 MHz COMMERCIAL QUALITY SCANNER

FEATURES:
- 99 MEMORIES
- FM-AM-SSB
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- OPTIONAL REMOTE CONTROL
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AZDAN

The brilliant new PCS-5000. 2 metre FM receiver C-MOS Technology now in stock.

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FM-240 has beaten the dollar. This unique 2 metre FM radio is a pleasure to own.

DAIWA

CS-401, 4 pos. coax switch	POA
CS-4, 4 pos. coax switch	POA
CS-401G, 4 pos. coax switch	POA
CS-201G, 2 pos. coax switch	POA
CN-620A, SWR/Power meter	POA
CN-520, SWR/Power meter	POA
CN-540, SWR/Power meter	POA
CN-410M, SWR/Power meter	POA
CN-460M, SWR/Power meter	POA

POWER SUPPLIES

Alinco EP 3030 30A (25A Cont.)	POA
Alinco EP 2510 30A (25A Cont.)	POA
Alinco EP 3010 30A (25A Cont.)	POA
Alinco EP 1510 20A (15A Cont.)	POA
Alinco EP 570 6.5A (5.5A Cont.)	POA
Daiwa PS 310M 31A (25A Cont.)	POA
Daiwa PS 120M 12A (10A Cont.)	POA

WELTZ

SP-600 SWR/P 1.6 - 500 MHZ	POA
SP-225 SWR/P 1.8 - 200 MHZ	POA
SP-220 SWR/P 1.8 - 200 MHZ	POA
SP 122 SWR/P 1.6 - 60 MHZ	POA
SP-425 SWR/P 140 - 525 MHZ	POA
SP-420 SWR/P 140 - 525 MHZ	POA
SP-350 SWR/P 1.8 - 500 MHZ	POA
SP-250 SWR/P 1.6-60 MHZ	POA
SP-45M SWR/P 140-470 MHZ	POA
CT-15A&N 50W Dummy Loads	POA
CT-20G 2.5 GHZ Dummy Loads	POA
CT-300 250 MHZ Dummy Loads	POA
CH-20A&N Coax Switches	POA
DF-72A 144/430 MHZ Duplexer	POA
TP-05X 50/144/430 MHZ P. Meter	POA
CC-50N 100-1300 MHZ Coax Coupler	TBA

ANTENNAS

Ali Bander	POA
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ANTENNA WIRE — MULTISTRAND HEAVY DUTY COPPER WARE — $0.75/m.

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Super large Egg for long-long wire — Rhombics & Guide Wires — $200

450 OHM OPEN FEED
Line in stock **$1.50/m**

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Cable **$2.90/m**

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The top of the line communication terminal for amateur and professional applications, it opens the world of CW, RTTY and new dual Amtor **$1699**

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Everything built in — including software. Nothing else to buy! RRTY, bit inversion (RTTY), ASC11, AMTOR Mode A (ARQ), Mode B (FEC and SEL FEC), Mode CW. Any speed any shift (ASC11 and Baudot) **$729**

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The FXR-550 decodes facsimile transmissions such as weather maps, weather forecast, marine forecast and sea ice forecast available through public facsimile broadcasts. The FXR-550 provides outputs for monochrome or R.G.B. monitors and a dot matrix printer **$899**

CODE CONVERTERS from TELEREADER
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HI-120U, 70cm, 100W, GaAS FET
H-60U, 70cm, 60W, GaAS FET
H-725D, 2m/70cm
H-160V25, 160W, 2m
HL-85, 85W, GaAS FET, 2m
HL-66V 6m, 60W
LA-2155E 2m, 150W

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If you have an NRD-515 receiver — Grab our below cost memory modules at **$100**

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PK-64 & PK-80

$760 $515

Both in stock

Work Packet, RTTY, Amtor and Morse with C-64 or C-128. Hardware and Terminal Software included.

PK-80 can be interfaced with any ASCII Terminal or PC and Standard Terminal Software.

● HAL CT 2200 & KB2100
Interested in CW-RTTY-HSC11 mode of communications? This RX/TX HAL system is all you'll ever need. Write for more Tech. Info. Reg. Price ~~$1790~~ **Special $1190**

NEW

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KT-220

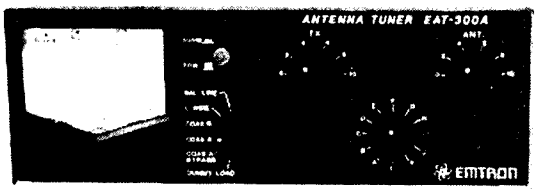
A SMART RADIO — THE INTELLIGENT CHOICE

Features:

- Two seven digit auto dial memories
- Simplified key board entry
- Ten memory channels
- Lockout mode
- Multiple modes of scanning
- 3 5-5C watts output
- Direct 12V DC operation possible
- Quartz clock
- Analogue S-meter for DF
- Slide on/off battery pack
- Many other features.

ONLY $479

NEW from EMTRON



The finest 300 watt antenna tuner on the market with quality that only EMTRON can provide! Unique features such as:

- Cross needle SW12 forward & reverse power meter
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OVER 700 FAMOUS EAT-300 SOLD!!!

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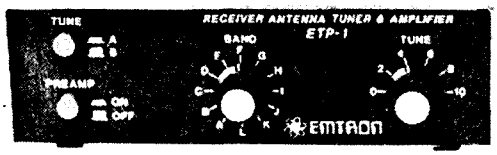
$210 + $10 Post

FOR SWL EMTRON DESIGNED ETP-1

Antenna Tuner & Low Noise Amplifier For Receivers!



ETP-1 will match your antenna to your receiver for maximum signal from MW to SW. It utilizes a low noise 12dB gain preamplifier to boost weak signals. Special spring loaded long wire terminals as well as SO239 connectors make ETP-1 the most versatile tuner/amplifier on the market.

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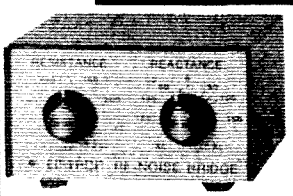
EMTRON ENB-1 RF NOISE BRIDGE



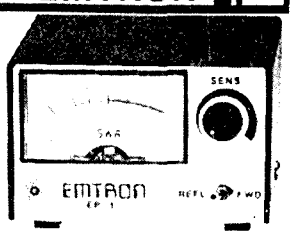
Professionally made NOISE BRIDGE for all kinds of RF measurements, antenna adjustments etc

$129

NEW QUALITY HF SWR METER — EMTRON EP-1

Specially designed with PRICE — QUALITY AND ECONOMY IN MIND. Freq. range from 3-50 MHz. Reads forward and reflected relative power. Ideally suited for amateur and CB services.

$49



NEW from EMTRON EAA230 active antenna, an SWL delight

Specially designed for SWL. Based on the famous "DRESSLER DESIGN", the unique electronic circuitry gives the receiver a perfect impedance match from 100 kHz to 30 MHz. A 12 dB low-noise pre-amplifier gives weak signals a boost. Comes complete with 240V AC 12 V DC supply and 10m of coax.

$259 + $15 Delivery

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Entrance from Little Lonsdale St
Ph:(03) 67 8551 or 670 0330

QLD:
416 Logan Rd, Stones Corner, Qld
Ph:(07) 394 2555

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

It was thought that every amateur knew the regulations to our privileges of operating in the spectrum, particularly in regard of interference to another amateur or legitimate transmission in a shared segment of the amateur's allocation.

Apparently, there is a rise in the incidence of deliberate interference to our fraternity and it is trusted that it is not a fellow hobbyist-experimenter, who would be reading these notes, that is responsible.

Fortunately, there are methods of tracking down such menaces and it would be advisable to take note of times and dates in UTC, frequency and duration of the interference in the station log. Advise your nearest Department of Communications office and drop a line to your State Intruder Watch Co- ordinator. Other amateur/s may also report the same incident, collaborating your observations, and giving the authorities something to work on.

If you have any suspicions as to who may be the offender, it would be wise to discuss it with the Radio Inspectors, where it will handled in strict confidence allowing them to conduct an unhindered and, if necessary, an effective visit. Offences of this type, if successfully proved in a court of law, bring heavy penalties to the offender and the loss of their equipment without personalities being involved.

Precise documentation is a must and collaboration of your observations are invaluable to the Department. Remember it is only an infinitesimal minority that cause trouble and generally they are not licenced to operate in the amateur bands, or any other part of the radio spectrum for that matter.

PROVE THE CRITICS WRONG!

Who said the bands were dead and DXing was a lost cause?

One amateur has proved the critics wrong, through his persistence and tenacity of setting a goal and keeping to it. Bill VK1WB, has worked 40 zones in less than five months using the 10, 15 and 20 metre bands. No, he was not running 100 kW ERP from a 10 over 10 multiband antenna, 100 metres in the air and staying at the rig for 24 hours-a-day, according to his log which he forwarded to me. The 200 contacts listed are all of interest, with contacts listed that many VK amateurs would donate their "eye-teeth" to have listed in their log.

Bill was using a 20 year-old SR150 and a 17 year-old SB200, directly coupled into a two-element 14 MHz, three-element 21 MHz and four-element 28 MHz quad, 14 metres above ground. Nothing special, but the credit for the achievement is his tenacity, listening and scanning of the bands — not overlooking 10 and 15 metres.

Congratulations Bill and thank you for the comprehensive list of QSL managers and addresses that you forwarded for the next listing which will be published as space permits.

By the time you read this Bill hopes to be active with a VK4 call sign. Changing call signs is not new to this gentleman. In 1948, he operated as VK3AWN, 1951 as VK3WL, and in 1968 signed VK3WL/WZ, and of course, not forgetting VK1WB.

Ladies and gentlemen, can anyone equal or better Bill's achievement at this point of the sunspot cycle?

ZONES WORKED BY VK1WB as at 0100 May 31, 1986

CALL	TIME	DATE	BAND	ZONE
KL7H	0500	17/03	14	01
VE2NN	0320	21/05	14	02
VE7ATP	0003	04/03	21	03
KA5SMA	0621	23/02	14	04
W2ORP	0715	09/01	14	05
XE1J	0234	06/03	14	06
TI2OY	0559	26/01	14	07
VP2EE	0007	22/01	14	08
P4/KQ2M	0848	16/01	14	08
HC2HX	0827	29/01	14	10
PY4LJ	0710	16/01	14	11
CE3OZU	0544	16/01	14	12
LU1FZR	0648	09/01	14	13
DJ4ZB	1116	01/01	14	14
HG19HB	1038	05/01	21	15
UO5OEK	1038	05/01	21	16
UJ8JCQ	1111	01/01	14	17
UA9TE	1119	05/02	14	16
RA0JD	0702	11/01	14	16
4Z4NM	1140	07/01	21	20
A4XKC	1223	10/01	14	21
VU2TTC	0520	11/01	14	22
JT1AS	1205	19/04	14	23
BV0BG	0559	05/01	14	24
JC1EHR	0812	01/01	28	25
HS0A	1045	29/03	14	26
DU2JL	1221	24/02	14	27
V85GA	0541	01/01	28	28
VK6AI	0721	11/01	14	29
VK3NOH/2	0136	03/01	28	30
KH6JJL	0004	06/03	28	31
ZL1AQ	0120	03/01	28	32
EA8BML	0842	04/03	14	33
GT2MG	0837	01/05	21	34
9N8ZHN	0730	16/03	14	35
9J2WS	0751	06/04	14	36
5X5GK	0720	06/01	14	37
ZS5YG	0549	11/01	14	38
3B8FP	0503	02/01	14	39
JW5E	1222	16/03	14	40

READERS

Nearly everyone is interested in another operator's station. *Are you?*

I would like to commence a series — *My Station* — with a photograph, complete with the operator of course, and a brief description of the equipment and the operator which will be reproduced as space permits. Can you participate? If so, please forward details to me via the address at the head of this column. All photographs will be returned after reproduction.

The management of GFS Electronic Imports, are kindly donating a prize for the best photograph and story printed during 1987 — so ladies and gentlemen, start writing. Black and white photographs are preferable, however sharp, clear colour ones are suitable.

MAIL FROM LEBANON

Difficulties for Lebanon, as it appears they have postal problems, and according to overseas publications, it is recommended that all mail be sent via Cyprus. It is then transferred from Cyprus by courier. At the time of writing these notes, Australia Post were not aware of any problems with letters though!

MOUNT ATHOS AGAIN

The Italian expedition was not permitted to proceed to Mount Athos. Apparently, they had a licence for "scientific research of the sunspot cycle."

There is no reciprocal agreement between Greece and Italy and the Greek authorities confirmed that there was to be a "scientific" expedition in the future, not a DXpedition. The Greek Society members were surprised when they discovered that the expedition was to be made by four noted Italian DXers, and wondered if it was to be made up of endless 5x9 QSOs.

The Greek Society learned that the Greek Civil Authorities and the Religious Authorities had granted a "permit" on scientific grounds, but these permits were reversed when the true story was known and the licenses addended by the Greek Government to read "no amateur transmission will take place for a scientific expedition."

It is maintained by the Greek Society that they did not interfere or insist on a cancellation of the permit to operate, but it is one of those things that we are left to ponder about. Also, who "conned" who or was it a misunderstanding from the start? Is it all in the best interests of the hobby?

My mention that an Australian monk is based at Mount Athos is true and it may well be that Mount Athos will be operated by its inhabitants in the future. This would put a stop to all the petty arguments. We, as DXers, wish them well in their endeavours to obtain their own licensees, but they may need assistance with their equipment due to economics, so be prepared for a fund to assist with donations if a major equipment manufacturer does not come to the fore. (Remember, China was assisted greatly by equipment manufacturers when they first came on-air!).

RALEIGH

Operation Raleigh is getting closer to our shores. I assume they will have no trouble getting a visitors licence from our country. When last heard they were in Fiji. All QSLs go to G4AAL, who left the vessel in Fiji and returned home. QSL via the bureau (the cheapest route) or direct if you require a card.

INTERNATIONAL REPLY COUPONS

International Reply Coupons (IRCs) are now 80 cents at Australian Post Offices, with a redeemable value of 55 cents for a stamp to another country. It really does pay to be a WIA member, as this is one of the advantages of saving money by going through your local bureau. If State bureaus care to send me their addresses, they will be printed in a forthcoming issue of this magazine.

HAVE YOU HEARD OF IT?

Itaparica Island, PT7BR/PY6, operated from this area recently. Believe it or not, my "modern" atlas does not list it, however an atlas bought at a "junk shop" for 20 cents many years ago lists it as near Brazil.

If not on your list, it may be well worth getting a QSL card as it is IOTA SA-23 for those interested in collecting islands for the IOTA Award.

FAVIGNANA ISLAND

Favignana Island and, wait for it, Rabbits Island, situated in *CQ* Zone 33, were active under the calls, I4ALU/IG9 and I4ALU/IF9 (IOTA AF-19).

These islands are located off the coast of Lampedusa Island, near the shoreline of North Africa, and the western coast of Sicily. A new IOTA island for you? QSL I4ALU and good luck.

JAPAN

KA2PF, is located in Tokyo. The KA2 prefix with two letter suffixes are issued to service personnel in Japan. The OSL address is W6CNA. This operator hopes to do a stint from Ogasawara later this year using a 7J prefix, with the same QSL information. We wish him well and hope there are some VKs in the log!

SPECIAL PREFIX

GB9DB, was from Great Britain to celebrate 900 years of the Doomsday Book of William the Conqueror. The Gs are certainly getting with it for issuing special call signs. Good or bad, it is one to have in the log and QSLs are via G4AYM, bureau or direct.

RTTY ENTHUSIASTS

Probably a new one for you, ZC4JA, is active in this mode from the Sovereign Base area. Watch for him on 14.096 MHz and get him in the log.

MOZAMBIQUE

C92AJ, has been reported operating from this area. Permission to operate is dubious, so hold direct QSLs until further advice is received.

MACQUARIE ISLAND

An excellent way of spending time on Macquarie Island, a much sought after DX Country and one of the outposts of Australia's sub- Antarctic, has been adapted from an article by one who has spent time on the Island, Peter Arden, a Meteorological Observer.

One form of entertainment is to participate in field trips using the numerous field huts located around the island's coast.

The island is 37 kilometres long and about five kilometres wide, so one needs about 10 days to visit all the huts in one attempt. Most of the Island is a 300 metre high plateau with steep cliffs down to the coast.

The plateau is exposed to the worst of the weather but the walking is quite easy as trails are well marked and easy to follow.

Friendly Elephant Seals on the Island.
Photograph courtesy Dave Shaw VK3DHF

The coast has a number of hazards for the walker. One of them is the one metre tall tussock grass with deep seal wallows between. Most of the tussocks are fairly stable and jumping from one tussock to the next is relatively simple. Occasionally, the odd tussock is unstable and tends to collapse tipping the walker waist-deep into a foul smelling, brownish-green slime. This eventually happens to everyone making the trip around the island.

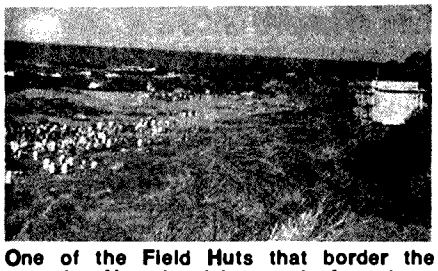
The next hazard that can be encountered is a long stretch of feather bed — a very wet bog, apparently bottomless in places.

Elephant seals are everywhere and block the only route. Attempting to move them only makes them more aggressive.

Some of the large Penguins one encounters on a walking trip around the Island.
Photograph courtesy Dave Shaw VK3DHF

Another hazard is the penguin rookeries. To find the route blocked by half a million irate, noisy penguins can be awesome. The environmental way to avoid the rookery is to walk through the surf, but the more practical and popular way is to walk slowly through the penguins and take what comes — sometimes displeasing!

Wherever one wanders on the island the weather is frequently windy with rain, drizzle, snow, hail or mist — sometimes all combined — which is unpleasant and a field hut is always a welcome sight after a long walk.



One of the Field Huts that border the coastline. Note the visitors at the front door.
Photograph courtesy Dave Shaw VK3DHF

The huts vary from a two-person shack with tiny windows to a very comfortable "lodge" with panoramic views of the coast and wildlife. All are stocked with food (mostly canned or dehydrated), fuel and other essentials, so one only has to carry a light pack. The huts are restocked in the summer time by helicopters. Kerosene heaters provide warmth, and Tilley lamps and generators light. Gas is available for cooking a much-earned hot meal.

There are no "mod cons" (toilets), so in the interests of environmental protection, one must go down to the beach below the high-water mark and keep a look out for a big wave. After some trial and error one becomes quite skilled at this operation even in force eight winds.

A shower consists of a bird-bath outside. The weather is not always bad and there is plenty of opportunity to leave the huts and explore the plateau, cliffs, waterfalls, vast slopes and gorges, or photograph the penguins, seals, albatrosses and other wildlife that are abundant on the island.

Hiking around Macquarie Island and relaxing in the huts is an enjoyable and interesting experience.

Well Peter, I am afraid I would rather walk to the local shops and take my chances of being hit by a "billy-cart", bike or car, and suffer the pollution on a sunny day . . . but on the other hand, I do not have much exercise . . .

A number of amateurs have visited Macquarie, two in particular come to mind, the first being Dave Shaw VK3DHF ex-VK9ZD and VK0HI, of Heard Island fame (who used to enjoy the walking trips), and Denise Allen VK0YL, the first lady amateur licensed on Macquarie Island. Denise enjoyed the area so much that she returned to a colder Antarctic base for a further stint within weeks of returning to Melbourne.

The following table shows the weather for July on the Antarctic-bases and it certainly makes one feel more comfortable about the winter we endured in Melbourne this year, although it was probably not as bad as Canberra, which had -8 degrees Celsius one morning. (Probably the morning the Budget was handed down!).

	MACQ	DAVIS	MAWS	CASEY
Mean station level pressure	996.7	980.1	981.2	980.7
Highest maximum temperature	7.7	-3.4	-8.8	-1.2
Lowest minimum temperature	-5.2	-35.1	-35.1	-29.2
Mean daily sunshine hours	1.0	0.0	0.0	0.0
Mean speed wind (knots)	13.2	9.5	0.7	0.7
Maximum wind gust (knots)	61.0	82.0	68.0	94.0
Days of strong wind	25	12	30	17
Days of gale force wind	25	4	14	12
Days of blizzard	0	4	3	6
Days of rain	29	0	0	0
Days of snow	14	15	5	17
Total rainfall (mm)	88.4	0	0	0
Total snowfall (mm)	0	39	0	13.2

Well, we thought the southern states were cold, and the northern states will be shocked at these figures, however I know where I would prefer to be with temperatures like that — by a cosy fire.

RECOVERY

It is reported that young Eric L30042, is slowly recovering and it will not be too long before he is back monitoring the bands. Good luck Eric and speed that recovery along!

MARION ISLAND

A note from Percy VK3PA, gives an insight into the much wanted DX country, Marion Island and the companion island, Prince Edward, both of which are under South African control.

Marion Island, is mainly a weather station located approximately 3200 kilometres south of Capetown. A tour-of-duty usually lasts for about 14 months.

Temperature varies from -5 to +10 degrees Celsius, complimented by high winds and heavy snow. Not an inviting holiday resort for sun-lovers by any means.

Some of the staff, as part of their duties, visit Prince Edward Island about twice a year. This island is uninhabited and the visit is to check the welfare of the area and the wildlife that is abundant.

Many years ago, mice came ashore from a ship visiting Marion Island, quickly multiplied and commenced dining on the birds eggs, drastically upsetting the ecology. The authorities had no option but to bring cats to the island to remove the mice. This was successful, however, another problem came to the fore — the cats, after finishing the mice, commenced dining on the birds and another ecology problem emerged! Dogs were then brought to remove the cats, a disaster that did not work and the dogs were transported back to the mainland.

One of the tasks/problems of the staff is to remove feral cats, a difficulty compounded by the number of cats against staff, whose number one priority and most important duty is weather observations.

The latest group on the island had an amateur on-board but he unfortunately only had a ZR licence (restricted) and did not apply for permission to operate until the day before the vessel left. Another amateur operation, due to the time factor and the operation, unfortunately was classed as being illegal.

The authorities are quite willing to grant operating permission to fully licenced amateurs going there for a tour of duty.

Lew ZS1SL and Nick ZS6BBY, supplied the above information to Percy and they mentioned that a well known DXer was intending to visit South Africa in October with a view to seeking permission to operate from this much wanted area. It is hoped that his negotiations were fruitful and we may hear ZS2 on the bands in the near future.

JAN MAYEN

Svien JX8KY, is working from the island during their winter months using a five element monobander on 20 metres. He hopes to also activate the lower bands as time permits and erect some suitable dipoles.

PALMYRA AND KINGMAN REEF

Plans are being formulated to activate this area in September 1987. It is early days yet and some of the operators involved are DL8NK, F6EXV, W0RLX, K8CW, and WA2MOE.

It is also intended to combine efforts with SM0AGD and activate 1S. My previous comments on the activation of this area still stands and due to the dangers involved I feel it should be *deleted* from the DXCC list immediately. Life is very precious and the risks are too great in this particular area.

QSL HEADACHE

The New Zealand licensing authorities have allowed the use of single letter suffixes for contest groups and special event stations. As it is possible that these will be re-issued after a short duration, who gets the QSL, and will the sender get one in return? The NZART Headquarters have a permanent allocation of ZL6A for special events and all QSLs go to the ZL Bureau. It would be prudent to inquire from the operator during the contact, of the QSL route when working one letter suffix ZL stations.

CONTROVERSY

The ARRL DXCC controversy is hotting up. Many are saying that they do not want to see a change, some say it gives everyone a fair go if it was recommenced, whilst others say that it has lost its creditability.

I personally cannot go along with the latter two comments, although it has been pointed out to me that many people have received blank cards to rare countries and they can, if they wish, fill them in and hope they are accepted.

I have received blank cards from various countries in the world and, with another VK, they have been returned to sender with some terse remarks. There is also a story of an amateur who wanted to set-up a sched for a certain rare country, and he wrote in good faith and received a QSL with no QSO. Is this honesty or fair sport? I feel that this type of occurrence is an infinitesimal percentage of all cards sent around the world every year, but it still occurs unfortunately and no rules, regulations or starting the DXCC from scratch again will ever deter the one dishonest person. Generally, the cheat is only known to himself and he has to live with his conscience — if he has one!

Some ARRL DXCC members have been banned over the years for forging cards and it is felt that the administration, in checking submitted

cards, are doing their utmost to stamp out such practices.

It will be interesting to see what John W4FRU, comes up with after consultation with his committee and whether the ARRL will adopt the recommendations. It is hoped that all concerned take every aspect of the implications that could occur with even minor changes.

Being personally critical, it is felt that the items such as the admittance of the Pribiloffs, 4U1VIC and a temporary deletion of 1S are far more important at this juncture.

FO0XX CARDS

The latest word is that they have been received from the printers but will not be mailed until all are filled out. Do not blame the mail service but wait patiently until they arrive, hopefully as a Christmas present!

PLAN AHEAD

The 1987 International DX Convention, sponsored by the Northern California DX Club, will be held at the Grosvenor Hotel in Visalia, on April 3 to 5, next year.

Further details may be obtained from the Publicity Officers, Jan and Jay O'Brien, the folk with the massive aerial (refer *How's DX* September AR), PO Box 700, Rio Linda, CA 95673-0700, USA.

JARL

A number of well known Japanese DX enthusiasts are trying to activate a number of rare countries under the JARL banner, to coincide with the JARL's 60th Anniversary.

LUXEMBOURG

A number of PA stations and one G-licensee were due to activate LX last month. All QSLs to PO Box 356, Dordrecht, Holland, or as instructed by the operator.

FRENCH BUREAU

A number of sources indicate that the French QSL Bureau is in a state of chaos since moving from Paris to Toulouse in March. Be prepared for a long wait or reluctantly spend a couple of dB and send direct.

FOUND

Through the help of *QRZ DX* and a couple of diligent sleuths, Bob **VQ9BP** has been located. He has the logs and cards and his QTH is PO Box 3152, Spartanburg, SC, 29304, USA.

CORA

The Radio Club of French Polynesia (CORA), was trying to sponsor a Clipperton Island DXpedition. The call will be FO8AA and operators so far include FO8JP (an experienced CW operator) and FO8LR Timing is unknown.

BITS AND PIECES

TY9ER was a pirate, so save the paper-work. **TY1ER** could be the same operator! Work first — worry later. ** **ZD9BV** will be QRV from Gough Island for about three years. ** **Esaat SU1ER** is still quite active — work him on his Thursday and Friday. Do not forget to get his daughter, who is also licenced, on the microphone. ** **VO2DX** was quite active recently from the much sought after **Zone 2.** ** **Heard Island** is being activated for scientific studies by the Australian Antarctic Division as from January 1, next year. How soon will Heard be heard again? ** **Joe W3HNK** has received over 2000 QSLs in unopened letters from **TI9CF**. Joe is taking over the duties to clear up the mess. Thanks Joe! ** It is possible that Chatham **Island** will start to climb the wanted list as the authorities are starting to wind down operations from this area. ** Friends of **Tom VR6TC** will be sorry to hear that he is in **ZL** for extended medical treatment. Good luck Tom, and to your daughter Jackie, who is commencing secondary schooling in New Zealand. ** **KH9AC** and **AH9AC** are active from **Wake Island.** Bob is very interested in 160 metres, so you "low band" enthusiasts go to it. ** Another operation from **5N, 5Z, 5H,** and **5X.** Chuck had medical problems, however he is at it again after recovering from an often fatal strain of Malaria which he contracted. If you were lucky, QSL to **WK6T.** ** **Krishna 9N1MC** who is the Chief Engineer at the Ministry of Telecommunications in Nepal QSLs quite promptly. ** **Ascension Island** only to a list! I do not believe it, but they are active as **ZD8DP** and **ZD8SW. Stuart ZD8SW** is working at the **BBC** relay station on a two year assignment. Their favourite frequency is **14.218 MHz.** ** **A22DP** is quite active for those that need this country. ** **Jim VK9NS** based on Norfolk Island, is now a member of the CQ "Hall of Fame. ** One American magazine is cutting its content due to the world economic structure. Quite a shame and apparently Australia is not alone with such problems! ** **Sojo VK0SJ** leaves Macquarie Island in December and reverts back to his normal call, **VK7ZSJ** in Tasmania. ** **TL8BA** is quite active, and if lucky, QSL to **SM2NOO.** ** **Andorra** was activated on both *CW and SSB in September.* If lucky, and you did not catch the QSL addresses, they are **C30AAN** to **DL8OH, C30DAJ** and **C30DAK** to **ON4TJ.** ** Still on Andorra, the **C30BBP, C30BBX** and **C30CYA** operation was around 10 000 contacts. QSL to **PA3BMJ** direct or economically through your bureau. ** **Dale VQ9QM** is putting up a 160 metre antenna. Band enthusiasts look for him at anytime when conditions are favourable to Diego Garcia. ** The **Australian Commonwealth Meteorological Bureau** is expanding its participation with Australia's satellite **AUSSAT.** ** Another station active from **Franz Josef Land** is **UA1OHL.** This is a backup for **UV1OO** and **RZ1OWA.** ** **Baldur DJ6SI** has been active as **5Z5EXP** ** **Don V3CH** has a new call sign, **V31PC.** QSL to PO Box 7, Punta Gorda, Belize. ** **Bjarne JW8FG** is not a member of the local radio society, therefore QSL to Bjarne, Bear Island, N-9176 via Norway. *There* is a weekly helicopter service to the island, weather permitting. ** **9X5WP** went QRT on August 10. ** **John 5W1FT** and his wife **Mary 5W1FM** are active around **14.194 MHz** about 0400UTC daily. ** Any **ZA** expedition has apparently died a natural death — unfortunately. One day it will appear, but everyone is asking when? ** **Bouvet Island** may appear this year or early next year for a very short duration, weather conditions being favourable! ** **Don Search** the person in charge of the **ARRL DXCC Desk** assistant has been upgraded, so Don is, after catching up with the backlog, looking for another contender for the position. ** **GB6RC** was used to coincide with the Scottish Amateur Convention.

THANKS

Sincere thanks are extended to the following:

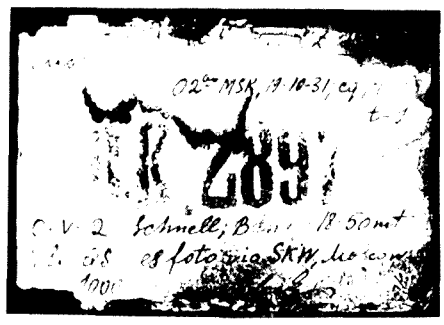
The Editors of weekly, biweekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-QSO, DX FAMILY FOUNDATION NEWSLETTER, INSIDE DX, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, PAPAKURA RADIO CLUB BULLETIN, ORZ DX, RSGB DX NEWS, and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER.

Magazines including, BREAK IN, cqDX, DX POST, JA CQ, JARL NEWS, KARL NEWS, OST, POLICE LIFE, RADCOM, VERON, WEATHER NEWS and WORLDRADIO.

Members who have contributed include VKs 1WB, 2PS, 2EBX, 3DHF, 3PA, 3YL, 3XB, and VK6NE. Also, Chrisla Stuckle, Peter Arden, KH6BZF and WB6GFJ. Sincere thanks to one and all who have made this months column possible.

er

ANTIQUE QSL CARD
courtesy Peter Wolfenden VK3KAU



ITALIAN ROBOT/BEACON STATION

Robot station, IY4M, operates on **28.195 MHz**, with either two or 20 watts output to a ground plane antenna. To contact IY4M, listen for a beacon sending *IY4M Robot QRV.* Send your call twice, being careful not to leave any extra space between characters. If the Robot hears your call it will ask for a signal report, then send you a report and a greeting.

—From *The ARRL Letter,* August 15, 1986

AMATEUR WINS

The Superior Court of California, county of San Francisco, ruled in favour of Mary Matheny KB6CLL, when she was sued by a neighbour for allegedly causing RFI.

The court ruled that the state court lacked authority to regulate and control amateur radio operators, radio emissions and radio frequency interference. The court said; "The Federal Communications Commission has the exclusive right and power to regulate, control and sanction amateur radio operations and radio frequency interference."

The court then granted KB6CLL's request for a summary judgment. This case will be an important reference for amateurs facing similar legal actions in the USA.

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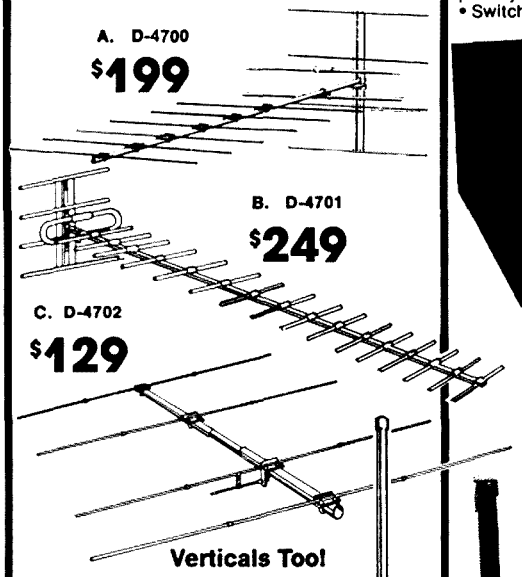

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D. 2m: Cat D-4703.....**$59.95**

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D. D-4703 **$59.95**

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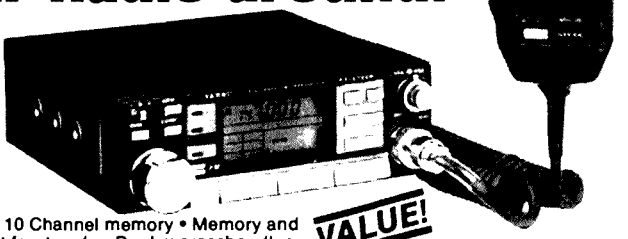

Here's the unit every amateur would want! Switchable 2m and 70cm bands for a wide range of amateur action. And this affordable, compact unit offers all the famous Yaesu features: • 10 Channel memory • Memory and priority scan • Dual independent front ends • Duplex crossbanding • Switchable 25W/3W power output. Cat D-3515

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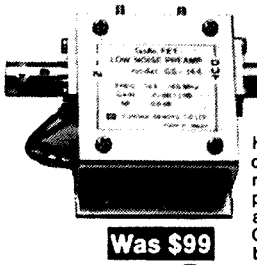

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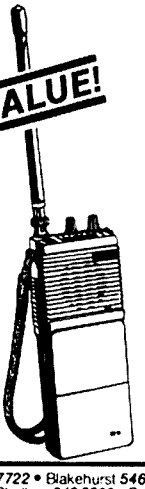
VALUE!



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B291

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mia*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Japan*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0SJ	*Macquarie Island (Keyer)*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Karratha*
52.325	VK2RHV	*Newcastle*
52.350	VK8RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RBB	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6BTW	*Albany*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Karratha*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Karratha*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.475	VK3RAI	*MacLeod, Melbourne'*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1. Ian VK3AQU, has written with more details of his beacon. The call sign has been corrected to VK3RAI. It is located at Macleod, a north-eastern Melbourne suburb, and has a power output of two watts (the licence allows for a maximum of seven watts). The antenna is a clover leaf and the mode, CW, with one minute of carrier followed by the call sign.

Ian would be interested to receive reports from those hearing the beacon, which would help determine its coverage. Reports to Ian Glanville, RMB 2139, Myrtleford, Vic. 3737, or he can be contacted on 3.650 MHz, Sunday mornings at 0000 UTC.

SOLAR FLARE

A letter from Chas VK3BRZ, sheds some more light on the huge solar flare last February, which resulted In many long distance contacts. Chas writes:

"Much has been written in the various radio journals, both local and foreign, concerning the solar flare of February 8, this year, and its effects on radio propagation. One aspect of this event seems to have been neglected: I refer to the high level of solar noise in the few days leading up to the flare.

"On the evening of Wednesday, February 5, Arie VK3AMZ, alerted me to the unusually high level of solar noise he was hearing on two metres. Sure enough, when I pointed my beam to the sun, the noise was very strong indeed. In turn, I called Daryt VK3AQR, and Bert VK3ZZX, who both observed the noise on two metres and six metres. Daryl also confirmed its existence on 70 cm. We all agreed that the level was around S7. This was about 7 pm local daylight saving time (0800 UTC). We continued to listen until, near sunset, the noise began to fade and peak with a period of 10 or more seconds (unfortunately I paid little attention to this detail) and gradually disappeared when the sun was well below the horizon.

"In the ensuing days, I made a special point of monitoring the sun in the mornings and evenings, the noise being audible at both times of the day, but becoming progressively weaker. By the evening of the seventh, the noise level had almost returned to the 'quiet sun' conditions. (Mornings and evenings were convenient because I could not alter the elevation angle of my antenna; I had to choose times when my antenna coould 'look' straight at the sun).

"I should point out that I had not previously encountered this phenomena. Solar noise I could hear quite often but it had never exceeded 2 dB above the receiver noise floor. (FT-480R with VK5 preamplifier, antenna 20 element, four bay collinear array). While I realise the sun was unusually active, I did not, at this time, associate this activity with a solar flare. I did feel, however, that changes would occur in radio propagation and noted that HF had died.

"The date of the flare is given by the IPS as February 8, and this date coincides with that of the auroral VHF propagation in the southern parts of Australia. The peak period of solar noise on VHF however, occurred on February 5, some days prior to the flare and accompanying propagation and actually diminishing to almost undetectable by the time of the enhanced conditions. Could someone elaborate on how the date of the flare is actually determined? That is, at what stage Is this kind of disturbance actually classed as a flare?

"I would also like to know if others observed this phenomenon (and perhaps did not recognise it at the time). In hindsight, it appears the enhanced VHF conditions might well have been predictable several days in advance. Needless to say I will be paying close attention to the sun in the future, and urge others with a similar interest to do likewise. These events are rather rare but extremely interesting from the point of view of the VHF enthusiast."

Thank you for writing Chas, and I hope your comments will keep the flames of interest kindled!

IC-551 NOISE BLANKER

The information I gave, in the September issue, of modifications to the noise blanker of the IC-551 obviously was gratefully received by a number of operators who have been plagued by power line noise in view of communications since received.

One such communication came from David VK3ADM, which gave additional information such that one would hope the final results would be similar to that already being obtained with the TS-600 noise blanker. The additional information is included for those wanting to achieve the ultimate in noise blanking of the IC-551.

David says; "The SEC have replaced poles, transformers, insulators and hardware, etc which reduced the power leak from S9 +30 dB to S7-8 on the IC- 551.

"a. The receiver was not realigned as I had completed this task six months prior, and the receiver specifications remained the same before and after the noise blanker was modified.

"b. I removed the top cover from the rig, pointed the beam at the noise source and proceeded to align L19 and adjust R65 with the noise blanker activated for minimum noise on the S-meter. Hence, the first problem was encountered. The power leak did not produce a stable enough noise source for a constant S-meter reading.

"c. SOLUTION: Wrap approximately two turns of insulated wire around a double insulated electric hand drill (plastic case type). Feed the end of the wire into the antenna socket of the IC-551 and lock the trigger on the drill to provide continuous operation. Adjust the number of turns around the drill until S9 is produced on the 551 with the RF gain set at maximum and the noise blanker off. Result — a stable noise source.

"d. Carefully align L19 and adjust R65 a number of times with the noise blanker activated until a minimal S-meter reading is obtained, note the reading; and

"e. Proceed to modify Q13 and R86 as detailed on page 37, September 1986 AR. Conduct set up and realignment procedure as indicated in sub-paragraph c.

"The figures listed below are indicative of the performance obtained (using drill as noise source);

"i. Before modification, noise blanker off, S-meter reads 9. Noise blanker on, S-meter reads 5; and

"ii After modification, noise blanker on, S-meter reads 2-3.

"When the antenna was reconnected and beamed at the noise source, the power leak was reading S8-9 +10 dB with the noise blanker switched off. With the noise blanker activated, the S-meter reading was 0. Peace and quiet on six metres at last!"

Thank you for the letter David, and the extra information given to ensure a worthwhile improvement in the noise problems of the IC-551. I shall try your noise source to fine-tune my IC-551 and hopefully this summer I will not need to replace the IC-551 with the TS-600 again — at least both rigs should be on a par.

All this, of course, makes one wonder why one manufacturer can produce such a superb noise blanker for six metres while another, with an equally good reputation for producing fine equipment, should install such a mediocre device! Even my old FT-101B has a superb noise blanker for use on power leak and with modern techniques, no quality rig should have to be put aside through inability to reject noise. I hope Icom will be reading these comments and do something about it.

OVERSEAS

CQ ham radio from Japan for August 1986 (via VK6RO) shows another station in China signing BY4RB and having a first contact on June 22, with JA6YMR. Later contacts were made to all JA call areas. Time was around 1530. Equipment used was a TR-9300 to a six element beam on an 8 metre boom and seven metres high. QSL to PO Box 413, Zhenjiang, China. Other stations from the same country include BY4AA, and BY1PK with operation usually around 50.110 MHz and often in CW.

The Japanese VHF operators have been having a lean time like we in Australia when it comes to exotic contacts. During June 1986, many contacts have taken place between Japan and HL1, 2, 4 and 5, all in Korea, and VS6 in Hong Kong. Apart from these areas, the Japanese operators have been amusing themselves listening to harmonics of shortwave broadcasters, namely, XSG on 50.748 which is a third harmonic of the original on 16.916.5 MHz and originates in China; UA-RADIO and BY-RADIO (USSR and China respectively) both originating on 7.230 and coming up on 50.610 MHz (and possibly one is jamming the other!), these are the seventh harmonics so the original signals must be very powerful! Chinese television comes up on 51.250 and Malaysian television on

53.750 MHz, and another commercial signing JOH appears on 50.180 MHz.

One supposes that being relatively close to other countries with exceedingly powerful transmitters, that harmonics will appear even if they are 60 to 80 dB down, especially if being received on first rate equipment with large beam antennas. I have had no reports of any of these stations ever being received in Australia.

My own schedule of listening and operating on the bands has been disrupted greatly of late. First the trip to Darwin reported last month, and since then, a trip has been made to Birdsville and Innamincka, but as there are no VHF operators in those areas, no visitations could be made.

Reports received however, indicate there have been spasmodic contacts on six metres between VK5 and VK2, while the usual VK5 to VK3 contacts have continued on two metres. I have received no reports of contacts across the Bight to Albany.

KNOW YOUR OPERATOR

Some years ago I ran a segment which gave details of some prominent (at the time) VHF operators and in some cases, included a photograph of the operator. It might be the right time to revive that segment. Last time I arranged it by personal invitation to those concerned to supply relevant information and in most cases, they responded. I would be pleased to hear from any VHF type who would like to pass on something about himself, the goals he has achieved including awards, and if possible, a photograph of the operator and/or antenna installation, etc.

Additionally, I would like to hear from more of you in regard to who you are working as it is becoming increasingly hard to give you news during the lowest part of the sunspot cycle. A number of people have been very faithful in keeping me informed but it would be great to hear from more of you. I rarely hear anything from VK4, VK6 and VK8. The *VK6 VHF Group Bulletin* helps to fill the gaps from the west, and the *The Propagator* tells me something about New South Wales, but otherwise I have to dig right to the bottom of the barrel to find something for you quite often.

THE ROSS HULL CONTEST

That perennial, the *Ross Hull Memorial Contest* comes up again in this column as I said it would in an attempt to muster continuing support for the Contest, particularly applying to the scoring and distance tables and the number of bands which might be used. If these do in fact become the Contest rules for this year, I hope all those with equipment on 52, 144, and 432 MHz will lend their support both in operating and swapping numbers, and most importantly, the submission of a log. If you do your original neatly in black pencil (this allows the use of a rubber for corrections) you can photocopy your log without the necessity of rewriting it. I have followed that method for a number of years and it works quite well, but the requirements for a legible log is first priority as far as the Contest Manager is concerned.

I hope to go out portable again this year. My wife has given permission as she believes home is the best place in the hot weather! I will be operational on 52, 144 and 432 MHz and look forward to having contacts with everyone on air and in particular any other portable stations. The period from 26/12/86 to 1/1/87 being one week, lends itself to portable operation. The Christmas festivities are over, all will have sobered up, and many people are able to get a few days break at that time, so it seems worthwhile to pack up the gear and go somewhere where you can get away from the power line noise, television interference, etc and enjoy some of the benefits from having a site which is probably better than your home station. I know I found an incredible difference operating portable last year from Meningie, when compared with my hill surrounded home site, especially for 70 cm. If enough were to go out it might warrant having a Field Day Contest run in parallel with the Ross Hull in subsequent years. Let me know if you have any ideas.

SPORADIC E CONTACTS

In AR, January 1986, I ran an article outlining what constituted long distance contacts and how at the moment Sporadic E medium was the means by which such contacts were possible, and at times of high sunspot activity, how F2 contacts were common. For the newcomers to the VHF bands, and six metres in particular, I would suggest this information be read again so you might have some understanding how such contacts are made. However, a brief recap here might be of some use.

In the main, six metre contacts via Sporadic E or Es for short, occur during the summer months and more particularly, during November, December and probably mid-January, after which contacts can taper off dramatically. Because they are sporadic they can nevertheless occur at any time.

Prime distances for first hop contacts will be around 2000 km (1200 miles) and double and triple hops will be multiples of these and less common. VK5 to ZL is a two hop contact. There seems some evidence to suggest that some contacts do "follow the sun" — ie as the sun makes its westerly trajectory across Australia (for the purist that means the earth's rotation!) then different areas open up for contacts. This seems particularly so when applied to stations out in the Pacific islands which seem more available during the early morning than later in the day. However, because these areas too are subject to the sporadic nature of the propagation, such contacts do occur at other times. Mostly therefore, if you want to work Noumea, it would be better to try during the mornings rather than later, and this applies to all areas out there.

Single hop contacts are usually the strongest with the level dropping in proportion to the extension of the distance. Under good Es conditions you will be surprised how strong the signals are and how only a few watts can be S9 at times at a 1000 miles or more!

In Australia we have a calling frequency of 52.050 MHz which is a frequency set aside for originating a contact and then moving to another portion of the band when contact has been established. Most stations will honour this arrangement and move off, particularly when the band is busy. However, you will find there are those stations who habitually use the call channel for contacts ignoring pleas from others to vacate it. I only hope newcomers will not fall into this habit. Sometimes you cannot avoid making a contact on that frequency, particularly if the station is a long distance contact, say out in the Pacific, and the call channel gives him the only chance at a contact as moving may put him under someone else. In this case, keep the contact very short and leave him to the multitudes. The call channel is very useful when the band appears dead as it gives stations in other areas a frequency to monitor, and if you give a call there from time to time, it is likely a contact will eventually result.

I would like to see more use made of the three second break between overs as this gives some other station a chance to be heard or come in with information which may be of value to all parties.

Most operating will occur within the first 100 kHz of 52 MHz. If you need to have a private contact with someone there is plenty of room further up the band where you will probably be left alone. CW will only occasionally be found on the band, mostly at the lower end, but is still very useful to complete a difficult contact. I remember working FO8DR in Tahiti, many years ago on CW — had I not done so I would not have worked that country as I have not heard a station from there since!

Generally speaking, the newcomer will find the VHF bands a pleasant place to have contacts and I hope you enjoy any time spent operating there. Incidentally, it helps when calling CQ DX to repeat you call sign many more times than you say "CQ DX" as that is likely to be read much easier than your call sign when the going gets tough and it is your call sign the other station needs for a contact.

SIX METRE STANDINGS

The next update of the Six Metre Standings will be in the February 1987 issue and new claims and additions or alterations need to be on my desk by December 15, if you want them included. Details required are the date of contact, time in UTC, call sign of station worked, country, mode, report sent and received, QSL sent and whether received. Split frequency contacts should be indicated, and please add your call sign and signature plus the date of your claim.

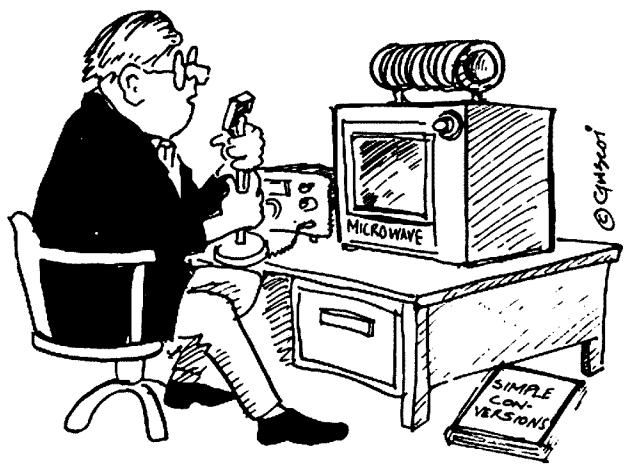
CLOSURE

Sporadic E contacts should be starting by the time you read this so here is hoping for another bumper year. Two metre activity will be uppermost in many shacks so there will be plenty of people looking for short skip six metre contacts.

Closing with two thoughts for the month: *It's not the difference between people that is the difficulty. it's the indifference.* And *We may not return the affection of those who like us, but we always respect their good judgment.*

—73 The Voice in the Hills.

SEE CONTEST COLUMN FOR FULL ROSS HULL MEMORIAL CONTEST DETAILS FOR 1986!



Cartoon courtesy *The Short Wave Magazine*, April 1986

"Well, it works O.K. on Top Band but it'll only do sausages . . ."

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

NOVEMBER

1- 2	International Police Association Contest (Details this issue)
- 8	Australian Ladies Amateur Radio Association Contest (Rules September issue)
8- 9	European RTTY Contest (Rules August issue)
—15	AHARS National CW Sprint (Rules October issue)
15-16	Oceania QRP CW Contest
—22	AHARS National Phone Sprint (Rules October issue)
29-30	CQ WW DX CW Contest (Rules this issue)

DECEMBER

6- 8	ARRL 160 metre Contest
14-15	ARRL 10 metre Contest
—13	Ross Hull Memorial VHF Contest commences (Rules this issue)

JANUARY

— 5	Ross Hull Memorial VHF Contest concludes

I would also expect that during January, *73 Magazine* will run their usual series of World SSB Championship Contests. To date, I have not received any details for these contests. Should you be interested in them, I suggest that the rules published in *Amateur Radio* magazine for December 1985 may be worth your perusal. In the meantime, should I receive details I will publish them as soon as possible.

It is unfortunate that now and again, copies of rules do not come to hand as early as one would like and thus I have such a situation this month. I was not able to publish the rules for the CQ WW DX Phone Contest prior to this issue. I publish them now to cover the CW event which is held at the end of this month. The rules for the CW World Wide DX Contests vary little from year to year, therefore I trust that the publication of this information will be of value to you in the future.

CONTEST CHAMPIONSHIP TROPHY

I have a correction to make to the results of the CW category for the Contest Championship Trophy, 1985. In the results listed in the September issue of *Amateur Radio*, it showed that Jim VK2BQS, was the winner of this section. Now, I can tell you that Jim is certainly a very honest man and I am proud to claim Jim as a friend in amateur radio.

Following a telephone call, plus other correspondence from Jim, it has been decided that the winner of this part of the competition will now be declared as being Lindsay VK5GZ. Jim VK2BQS, drew my attention to certain facts which precluded him from rightfully being declared the CW section winner.

Lindsay VK5GZ, is certainly a worthy winner of the competition as he has over the years supported the various contests organised by the WIA. He is also a very keen CW operator and has certainly done his very best to popularise that mode of transmission. He has always shown his keen interest in Institute matters and has made many submissions to the VK5 Division on both Divisional matters and suggestions for Federal Agenda items. Our heartiest congratulations to you, Lindsay.

ROSS HULL MEMORIAL VHF CONTEST

The last two years operation in this contest has seen a very disappointing result in the way of entries. Efforts have been made to try and increase interest, but to this stage, to no avail. For yet a third year the rules have again been altered to try and encourage all those VHF operators out there to participate. I have already expressed my firm opinion that if this coming contest does not show an improvement in entries there will have to be a long hard look at the future of the Ross Hull Contest and its present format. It appears that there is perhaps hardly any interest at all. Quite some time ago now, I circulated a copy of a discussion paper regarding VHF/UHF aspects of contests. To date (end of September) little comment has been forthcoming. Maybe nobody really wants any VHF contests at all!

There has been some suggestion that this FCM actually wants to do away with the Ross Hull Contest, however I simply stand on my record in that I have done as much as anyone to try and breathe some real life back into the VHF contest scene. In fact, I rather feel that for the interest shown, I have put more effort into trying to maintain this contest than has ever been put into discussion on HF contests. No! I am neither against nor unskilled in the matter of VHF and higher frequencies. I do in fact, quite often work at frequencies up to around 25 GHz. (For the uninitiated that is 25 000 MHz). This I do in my professional work on a daily basis. So, I hope that these few statements may do just a little to refute the odd rumour or misunderstanding which may exist. I will however still maintain that the only measure that the FCM has of the success and interest, or otherwise, of a contest is by the number of entries submitted for the contest.

I now provide for you the rules for the 1986 Ross Hull Memorial VHF Contest, together with various comments dealing with the changes made.

Objects — Australian amateurs will endeavour to contact as many other amateurs as possible.
Period — From 0001 UTC, December 13, 1986 to 2400 UTC, January 5, 1987.
Exchange — RS/T plus three figure serial number beginning at 001 and increasing by one for each contact. When 999 is reached, a start is made again from 001.
Bands — 52, 144 and 432 MHz. Six metres contacts valid only between 52 and 54 MHz. Simplex contacts only; no cross band contacts.
Operator — Single operator only. One transmission only at one time.
Contacts — One contact per UTC day per band with each station.
Duration — a. Seven UTC days, not necessarily consecutive.
b. Two UTC days consecutive.
Modes — Any mode of operation may be used for any contact; eg CW, SSB, AM, FM, ATV, RTTY, SSTV.
Scoring — 52 MHz: up to 1000 km, two points; 1000 to 2000, one point; over 2000 km two points.
144 MHz: up to 500 km, two points; 500 to 1000 km, five points; over 1000 km, 10 points.
432 MHz: up to 500 km, four points; 500 to 1000 km, 10 points; over 1000 km, 15 points.

These scores are for Australian amateurs contacting one another on the Australian mainland and Tasmania.
Bonus — For every completed 10 contacts entered in the log book each UTC day, add a bonus of 10 points to the day's score.
Overseas Stations — Contacts from VK1-VK8 inclusive to VK0, VK9, P29, H44, FK, ZL and other Pacific and outside areas to be five points on 52 MHz; 10 points on 144 MHz and 15 points on 432 MHz.

Stations outside the Australian mainland and Tasmania contacting Australian stations will also score in accordance with the scale above.
Log Sheets — It is desirable that logs covering the complete period of the contest be submitted for cross-checking purposes. Clear, neat photocopies are acceptable. The following details must be shown:
Date and Time in UTC, Band, Emission, Station Worked, RS/T and Number Sent, RS/T and Number Received, Points, and Bonus. Each page must be numbered and totalled at the bottom.
Front Sheet — A Front Sheet must be attached to the log entries showing the following information in this order:
Call Sign, Section, Total of Daily Points with Bonus Points added to provide a total for the best seven UTC days. List the best two UTC days with daily score, bonus and two day total. List the bands on which operation has taken place.
Declaration — "I certify that I have operated in accordance with the rules and spirit of the contest." Name, address, signature and date.
Awards — A perpetual trophy is awarded annually for competition between members of the Wireless Institute of Australia. The winners name is inscribed on the trophy and the winner receives a suitable certificate. The entrant with the highest overall score in the seven day section will be the winner and their Division will hold the trophy for one year.

Certificates will be awarded to the highest scorer in each State for the seven day period and to the highest scorer in the two day section (one certificate only). No entrant may receive more than one certificate.
Submission of Logs — Entries are to be forwarded to the Federal Contest Manager, WIA, GPO Box 1234, Adelaide, SA. 5001. Entries must be received no later than Friday, February 6, 1987. Please endorse the outside of the envelope *Ross Hull Memorial Contest*.
Receiving Section — Logs for the receiving section must show the same information as for a transmitting log, except for the second number exchange. If both stations participating in the contest are heard, both may be claimed, but must be listed as separate entries on the log. Any scoring contacts may be logged with no limit to the number of times that one station can be logged.
Disqualification — The Contest Manager may disqualify logs which are illegible or improperly set out and do not conform to the rules laid down. See the General Disqualification Criteria as published in *Amateur Radio*, August 1984. Any station observed during the contest as constantly departing from the generally accepted codes of operating ethics may also be disqualified.
Ross Hull Memorial UHF Contest — As the bands 576 MHz and above have been removed from the 1986 contest, it may be desirable to hold a contest along similar lines as the VHF contest for the UHF region.

The FCM would appreciate feedback from those amateurs with the potential to operate on the UHF bands with a view to possibly arranging such a contest to run in parallel with the VHF contest. If sufficient interest is indicated, it should be possible to obtain a suitable trophy for annual competition.

Comments on the Rule Changes for the 1986 Ross Hull Memorial VHF Contest

1 There seems little doubt one of the main inhibiting factors for the submission of logs is the fact that there are quite a number of very active amateurs able to operate on six or more bands. Those without this facility feel it is a waste of time sending in logs to a contest in which they have no hope whatsoever of winning. By limiting the contest to 52, 144, and 432 MHz for the time being, it does provide an area where there are many operators, most VHF amateurs have 52 and 144 MHz and an ever increasing number have 432 MHz. In the future, it may be possible to expand the contest to include 1296 MHz, but for the time being it is limited to the first three bands.
2 The one point per contact irrespective of distance was not well received and certainly did stop a lot of participation in 1985. The 1986 scoring table takes care of this and rewards the efforts required to make long distance contacts. At the same time, the scoring table has been kept relatively simple. It has also recognised the value of stations from outside

Australia who are prepared to issue numbers in the contest and given such contacts a reasonable points score.

3 The bonus system of 1985 made it more worthwhile to chase prefixes than to have contacts with stations already on the bands in areas which may have already been worked. By giving a bonus after 10 contacts will ensure there is some incentive in working as many stations as possible.

4 A number of operators wanted no contacts under either 50 or 100 km, depending on their attitude. Whilst this seemed fair enough at first thought, it is not fair in a case where there may be a station say 60 km out of a city metropolitan area who is able to work all and sundry living in the city, but each city operator can only have one contact, whereas, if they can work at any distance, they do have the right to work across town and thus be on a more even score with the slightly isolated station.

5 Doubts were raised as to the need for the contest scoring to be taken over the whole three weeks. An operator is only able to spend whatever time he has available on the contest, if it be three weeks that is fine, but it may only be 15 days, etc. But if he takes the best seven days then he may stand as good a chance as the three weeks amateur and the very high scores he is receiving from the long time operator will not mean he will have no chance of winning as it did when it related to the full period. Even though a three weeks operator might have more chances than one with *less* operating time, if both are in fact working the bands on what could be said to be good days, then both have an equal chance of making the best scores.

6 Certificates: For the 1985 contest, a total of nine certificates were issued on the basis of a total number of 11 entries. (Only 11 entries for the whole of Australia in a National contest?). To my mind this approach seems to detract to a large degree from the value of a certificate. We will however, persist again this year with the approach shown above in the hope that more entries may be forthcoming. Perhaps looking at this aspect of things may help you to understand further some of my earlier comments regarding lack of interest.

INTERNATIONAL POLICE ASSOCIATION CONTEST

This contest is run on two consecutive days as follows:
CW: Saturday, November 1. SSB: Sunday November 2. 0600-1000 UTC and 1400- 1800 UTC.

The International Police Association Radio Club Contest is again organised by the German Chapter. Participation is by members and non-members in three classes: single operator, multi-operator and SWL. The same station may be worked on each band and mode for QSO and multiplier credit. CW and SSB should be scored separately.

Exchange — RS/T and QSO number beginning with 001. Club members will identify by including IPA and their State if in the USA. Non-members in the USA will also include their State.

Scoring — One point per QSO, five points if it is with an IPA station. Multiply the total by DXCC countries and USA States worked on each band with an IPA station.

Frequencies — CW: 3.575; 7.025; 14.075; 21.075; 28.075. SSB: 3.650; 7.075; 14.295; 21.295; 28.575. DX: 3.775; 3.800; 7.075; 7.100 MHz.

Awards — Certificates to the three highest scorers in each class and each mode. Contest contacts can be applied to the *Sherlock Holmes Award* and *Trophy*. (Requirements for these were not provided. I wonder if our Awards Manager has heard of these? FCM).

Mailing — Deadline for contest logs is December 31, 1986. They should be posted to Anton Kohten DK5JA, PO Box 40 0163, D-4152 Kempen 1, West Germany.

REMEMBRANCE DAY CONTEST

At present, I am extremely busy keeping up with sorting, checking and collating the logs which are pouring in for the Remembrance Day Contest. From a preliminary look at correspondence received with logs, it appears that this contest was, as usual, enjoyed by a large number of operators. I hope to have the results out much earlier than has been the case for quite a number of years and I also trust that not too many mistakes will be made by myself whilst dealing with the large volume of incoming logs and material. At this stage, I would to make several comments. It is apparent that the majority of operators do read the rules and put at least a little thought into the preparation of their entries. It is also apparent that some do not bother at all. I cannot understand why these few do not recognise the fact that HF and VHF are shown as completely *separate categories* in the rules and thus, it would be expected that *separate logs* should be submitted for each category. Likewise, that Phone and CW are *separate sections* and again *separate logs* are necessary. This also extends to the Front Sheet which is required. Life would be so much easier for a Contest Manager if the minority of operators would think just a little more about how the rules are worded. Just an extra three minutes spent on each of 10 logs sorting out such problems, caused by lack of thought or consideration, means an extra 30 minutes work by your contest manager on top of his other time. (And I can assure you that this "complaint" refers to more than just 10 logs, too!). In some cases, there is a complete lack of front sheets and declarations and in others, the writing is almost illegible. Yet again, there are instances where the entrant has obviously not had any regard to the nature of the item he has posted. Large *envelopes or* bulky packages naturally cost more to mail and this FCM is not prepared to pay out 45 to 50 cents-per-time to accept mail which has insufficient postage! In such cases, the items have been returned to the Post Office as per the instructions shown on the card accompanying such items. So *please* take that little bit of care in preparing and submitting your entries in contests. It will be beneficial to both of us.

Finally, just a little further comment on scoring and other associated matters. I have followed a policy that, where phone and CW are concerned, they are always entered into entirely different sections. Thus, it does not matter that the scoring value against each contact is exactly the same. CW operators compete against each other and phone operators do likewise. I could make the thing totally ludicrous, and artificial, by allowing 100 points for every CW contact. I simply ask you what would this achieve? This matter has been looked at and discussed at length with quite a number of operators. The way I have applied this approach has been consistent. In the case of the Remembrance Day Contest, it is necessary that this method be followed as with any other approach the results could become badly biased and against the whole purpose of the formula used to determine the winning Division in the contest.

Some operators have queried the dropping of the "Open" section in the RD. This was done for more than one reason. With the separation of the contest into two categories; ie HF and VHF it was felt that sufficient sections would exist and that matters should be kept as simple as possible. (See note above. Some operators cannot follow even the simpler rules). Further, there is no bar to any operator entering into more than one section in the contest. If he wishes to do this he increases the number of logs entered on behalf of his Division. Such an approach also allows him to add to the Divisions score, provided he works the minimum (10) contacts for the mode concerned. This approach is considered to be simple and fair to all concerned. Some future contest manager may see fit to vary this approach. If you have any comments to make on this subject, perhaps you may wish to air your views by writing me a letter.

I would also like to take the opportunity of pointing out one more aspect regarding my position. The 1986 Remembrance Day Contest will be the last of that particular contest that I will be fully responsible for. I will however, be responsible for the compilation of the rules for the 1987 contest, whilst my successor, as FCM, will take over from that point. This being the case, I feel that it would be most unfair for the 1987 contest to be run under rules any different to those which currently exist. I therefore propose that the rules for the 1987 Remembrance Day Contest should remain as they were for 1986. I would also like to think that to a greater degree, the rules for all of our WIA sponsored HF contests will, by now, have become stabilised and that they may stay that way for some time to come.

So, for now, I again wish you all the best in your activities.

—73 de Ian VK5QX.

1986 CQ WORLD-WIDE DX CONTEST

Phone was on October 25-26.
CW: November 29-30.
Begins 0000 UTC Saturday . . . Concludes 2400 UTC Sunday.

Objective — For amateurs around the world to contact other amateurs in as many zones and countries as possible.

Bands — All bands, 1.8 to 28 MHz, except for WARC bands.

Types of Competition —

1 Single Operator (single band and all band). Single operator stations are those at which one person performs all of the operating, logging, and spotting functions. The use of DX spotting nets or any other form of DX alerting assistance places the station in the Multi-Operator category.

2 Multi-Operator (all band operation only).
a. Single transmitter, only one transmitter and one band permitted during the same time period (defined as 10 minutes). Exception: One — and only one — other band may be used during the same period if — and only if — the station worked is a new multiplier. Logs found in violation of the 10- minute rule will be automatically reclassified as multi-multi to reflect their actual status.
b. Multi-Transmitter (no limit to transmitters but only one signal per band permitted).
c. All transmitters must be located within a 500 metre diameter or within the property limits of the station licensee's address, whichever is greater. The antennas must be physically connected by wires to the transmitter.

3 QRPp (single operator only). Power must not exceed five watts output. Stations in this category will be competing only with other QRPp stations for awards.

4 Team Contesting. A team consists of any five radio amateurs operating in the single operator category. A person can be on only one team per mode. A team **must** operate from two continents. Competing on a team will not prevent any team member from submitting his personal score for a radio club. A team score will be the sum of all the team member scores. SSB and CW teams are totally separate. That is, a member of an SSB team can be on a totally different CW team. A list of a team's members must be received by November 15 for CW. Send a list to *CQ* Att: Team Contest, 76 North Broadway, Hicksville, NY 11801. USA. Awards will be given to the top teams on each mode. A list of a team's member's scores plus the total team score must be submitted to *CQ* by the normal contest log deadlines.

Number Exchange — RS/T report, plus zone; ie 57905.

A station in a zone or country different than that indicated by its call sign is required to sign portable.

Multiplier — Two types of multiplier will be used.

1 A multiplier of one for each different zone contacted on each band.

2 A multiplier of one for each different country contacted on each band.

Stations are permitted to contact their own country and zone for multiplier credit. The *CQ* Zone Map, DXCC country list, WAE country list, and WAC boundaries are standards.

Points —

1 Contacts between stations on different continents are worth three points.

2 Contacts between stations on the same continent but different countries, one point.

3 Contacts between stations in the same country are permitted for zone or country multiplier credit but have zero point value.

Scoring — All stations: the final score is the result of the total QSO points multiplied by the sum of your zone and country multiplier.

Example: 1000 QSO points times 100 multipliers (30 Zones plus 70 Countries) equals 100 000 (final score).

Awards — First place certificates will be awarded in each category listed under Type of Competition, in every participating country and each call area of the United States, Canada, Asiatic USSR and Japan.

All scores will be published. To be eligible for an award, a Single Operator station must show a minimum of 12 hours operation. Multi-operator stations must operate a minimum of 24 hours. A single-band log is eligible for a single-band award only. If a log contains more than one band it will be judged as an all-band entry, unless specified otherwise.

In countries or sections where the returns justify, second and third place awards will be made.

All certificates and plaques will be issued to the licensee of the station used.

Trophy winners may win the same trophy only once in a two-year period. In the event that the same station wins the World Award in the same category in two consecutive years, a special *CQ* Magazine Championship plaque will be awarded the second year. The sponsored trophy in that category will then be awarded to the second-place contestant in that category, if the returns justify the award.

A station winning a World Trophy will not be considered for a sub-area award. That trophy will be awarded to the runner-up of that area.

Club Competition —

1 The club must be a local group and not a national organisation.
2 Participation is limited to members operating within a local geographic area defined as within a 275 km radius from the centre of the club area (except for DXpeditions especially organised for operation in the contest.
3 To be listed, a minimum of three logs must be received from a club and an officer of the club must submit a list of participating members and their scores.

Log Instructions —

1 All times must be in UTC.
2 All sent and received exchanges are to be logged.
3 Indicate zone and country multiplier only the *first time* it is worked on each band.
4 Logs must be checked for duplicate contacts, correct QSO points and multipliers. Submitted logs must have duplicate contacts clearly shown. The *original* log may be requested by the Contest Committee if further cross-checking of the log is necessary.
5 Use a separate sheet for each band.
6 Each entry must be accompanied by a summary sheet showing all scoring information, category of competition, contestant's name and address in BLOCK LETTERS and a signed declaration that all contest rules and regulations for amateur radio in the country of operation have been observed.
7 Sample log and summary sheets and zone maps are available from *CQ*. A large self-addressed envelope with sufficient return postage or IRCs must accompany your request.
If official forms are not available, make up your own, 80 contacts to a page on 215 x 279 mm paper.
8 All entrants are required to submit cross-check sheets for each band on which 200 or more QSOs were made. All other entrants are encourages to submit cross-check sheets.
9 Duplicate contact penalty: up to one percent — three additional contacts removed; one to three percent — 10 additional contacts removed; over three percent is grounds for possible disqualification.
10 QRPp stations must indicate same on their summary sheets and state the actual maximum power output used, with a signed declaration.

Disqualification — Violation of amateur radio regulations in the country of the contestant, or the rules of the contest; unsportsmanlike conduct; taking credit for excessive duplicate contacts; unverifiable QSOs; or unverifiable multipliers will be deemed sufficient cause for disqualification. (Incorrectly logged calls will be counted as unverifiable contacts).

An entrant whose log is deemed by the Committee to contain a large number of discrepancies may be disqualified from eligibility for an award, both as a participant operator or station, for one year. If an operator is disqualified a second time within five years, he will be ineligible for any *CQ* contest awards for three years.

Actions and decisions of the *CQ* Contest Committee are official and final.

Deadline — All entries must be postmarked no later than December 1, 1986 for the Phone section and January 15, 1987 for the CW section. An extension may be given if requested. Indicate phone or CW on the envelope.

Logs to be Forwarded to — CQ Magazine, 76 North Broadway, Hicksville, NY 11801.

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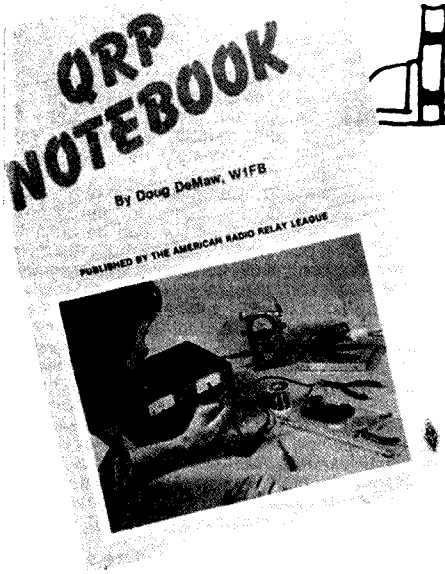
Book Review

Evan Jarman VK3ANI
Technical Editor



QRP NOTEBOOK

by Doug DeMaw W1FB & published by the ARRL

Doug DeMaw was formerly a technical editor of *QST* and a co-author of one of the best books ever written for the radio amateur[1].

QRP Notebook, as the author noted in his preface, follows his preferred style of writing; plain language. However, his reluctance to use photographs and "fancy diagrams" is lamented by at least one reader. This book has chapters devoted to receiving, transmission, transceivers, accessory gear and a workshop.

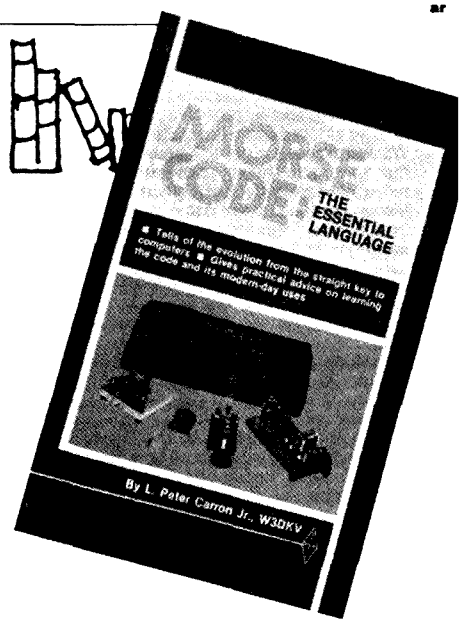
In navigating between simplicity and complexity, the author has missed the mark. Whilst the description of the theory behind the practical work is simple, the information required for construction is insufficient. Conversely, the level of theory does not match the constructional ability expected. No PCB designs are included, Indeed the author expects the reader to construct the various projects from schematic diagrams. These PCB layouts, for most constructors, are essential and it is hoped that these are not considered to be "fancy diagrams."

For a beginner, and I showed it to others, the book was confusing. The greatest complaint was the lack of photographs. All wanted to see the completed article; a picture of what is being aimed at!

The author has attempted to economise in order to produce the book. I see it as a book that was produced to suit a budget instead of satisfying a need.

His previous effort[1] is still highly recommended.

Reference 1 — Wes Hayward and Doug DeMaw; "Solid State Design for the Radio Amateur" — American Radio Relay League.



MORSE CODE: The Essential Language

By Peter Carron Jr, W3DKV & published by the ARRL

Morse code, by its nature, does not lend itself to description in a book. It is something that most people can only appreciate from experience.

This book only reinforces this belief; I love Morse code, but I do not like the book! To me it has only a superficial description of the facets of Morse code and lacks much of the substance.

Morse Code is written for the American market and many of the procedures, frequencies and equipment described, do not translate well to Australian conditions.

The book starts with some of the history of code development after justification of the code's existence. It then describes the code (both International and American Morse), and describes some techniques used to learn it.

Operating equipment, handling of emergency calls, as well as a look into the future complete the book.

Morse Code has several deficiencies in addition to its American orientation.

In the history section, the Vail family received very short mention, when Alfred Vail did more work on the code than most credit him for.

Key construction and operation is for Americans and most operators in Australia would oppose what is described. I recommend that this section is ignored.

There are other criticisms, but these are minor. They are things such as the definition of a word; the book defines a word as any five letter group. Usually, for speed considerations, a word is either *Morse or Paris*, as both have the same length. Also, the use of ON as internationally accepted is wrong. By example, QNH does not mean that your net frequency is high, it is an adjusted barometric pressure used mostly for aviation and meteorology.

I enjoyed reading the history of Morse Code, but as a whole, I can find little to recommend in this book.

ar

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

The community, and radio amateurs especially, are still suffering from electro-magnetic compatibility problems, as predicted by the writer 30 years ago. We are still waiting for EMC standards for appliances, backed by the new communications legislation. We hope that both will be at least as effective in protecting appliance and transmitter users, as has already been the case overseas for a number of years.

Please tell us your EMC appliance problems In cases where manufacturers of broadcast, television, video recorders and computers were willing, able and successful in improving their products. They deserve our appreciation and gratitude. The interesting cases will be published in AR. We can all learn from others' experience. For a start, let me briefly mention some of mine.

DEFINITIONS

TVI: Interference to television reception by illegal radiation.
TVA: Television reception is Affected by legal radiation due to insufficient (perhaps illegal) immunity, or selectivity, or too great susceptibility.
ITV: Interference to radio reception by (perhaps illegal) radiation from the television set.

1. THE HOPELESS, UNFORTUNATELY TYPICAL, CASE

Neighbour X knocks at the door one evening.

VK2AOU — Who is there please?
(No reply by neighbour).

Neighbour X (Pointing at VK2AOU and shouting) — You are causing interference to my television!

VK2AOU — I am sorry that you have this problem with your television. Please come inside, and see that my transmitter does not affect my television or video recorder!

Neighbour X — I am not interested!

VK2AOU — My transmitter does not cause interference. It is operated according to the legal requirements of the licence granted by the DOC, and was checked by Radio Inspectors.

Neighbour X — I am not interested!

VK2AOU — If you give me your name and address, I may be able to help you by attaching a filter to improve the selectivity of your television. Or we could contact the Service Department of the manufacturer, who may be on the list of those who are willing to assist customers.

Neighbour X — I am not interested. I will complain to the Post Office.
(Neighbour leaves).

2. THE WELL-INFORMED, FRIENDLY NEIGHBOUR

Dennis came one day, saying, "I am sorry to tell you that my television is not selective enough. I can see lines when you transmit. I know this problem from the UK. If you could perhaps make a high-pass filter? Drop it in my letter box. I can install it myself."

That fixed it. *** About 10 years later he came again, grinning, and said, "Thanks for the filter. My new television does not need one. Here it is. You can give it to a less lucky neighbour."

The radio amateurs' life would be easy if all neighbours with EMC problems were like Dennis!

3. LATER TELEVISION MODELS ARE NOT NECESSARILY BETTER

A friendly neighbour apologised to tell me that he had recently experienced TVA. I went to see his television set. There was an older television set, which was not affected by my transmission, and on top stood a new model of the same brand, which was affected. This made it clear that the new set would not comply with EMC immunity standards as they have applied in West Germany for years, making import to that country illegal. So the inferior television set is sold in Australia to uninformed customers. Since the well-known television rental and sales firm was on the "Assist List" compiled by VK3QQ, I wrote a letter to the service department explaining the situation, asking the neighbour to counter sign the letter. I have not received a reply, nor did I get any further complaints. High-pass and mains-line filters did not help. The shielding of the filters could not be earthed effectively, because there was not much of a metal chassis.

4. THE HELPFUL GRAETZ COMPANY

A neighbour (the lady was from Hamburg, the husband was Australian) told me that my transmitter affected their latest model high class Graetz television set from West Germany. All my efforts with high-pass and mains-line filters, coaxial feeder and balun (which I bought) were in vain. They phoned the importer's service department several times, and I too wrote to them. We never received an answer. I wrote to Graetz in West Germany, and received a very friendly letter 10 days later. They stated that their television set incorporates the latest design features to avoid TVA problems. They were surprised and sorry that we had any problems. They said further, that two of their service technicians were on an Asia-Australia training tour, and would soon be in Sydney to train local service people. They would arrange for these experts to attend to our complaint. Three weeks later, after half and hour of tests, they had fixed it free of charge. They did not say what they had done. This was in December 1976.

5. THE TELEVISION SERVICE MAN

Our neighbour next door has a bargain television set (VHF only), which is not only affected by my legal transmission on 14 MHz, but also causes severe interference (ITV) due to a strongly radiating line- frequency oscillator. About every 15 kHz a 4 kHz wide noise band of S7 signal strength is radiated, often making it impossible to have QSOs with less strong stations from the south-east of Europe on long path. There is an Australian standard (the same as in DL) specifying the permitted maximum radiation from television sets. My own Kreisler set is clean! The bargain set had been bought from a firm which was also on the EMC "Assist List", (AR, March 1982).

The neighbour called the service man, who told her to write to the DOC to have my transmitter shut-down, so she told me later. Having been informed by me on EMC, she did not follow his proposal. The high-pass filter the service man brought was absolutely useless, even when I asked him to Install it directly at the tuner. My home-made filter brought some improvement. A coaxial cable 2x1 turn transformer at the antenna terminal helped too to some degree. Earthing the feeder braid to a water pipe, where the feeder enters the house at floor level helped too. So did a 30 degree antenna direction change. Hearing the line oscillator tells me when to use low power (100 watt PEP maximum), or to turn the beam away when possible.

I invited the service man to see that my television was not affected, and I showed him the transmitter, attached low-pass filter, and that no RF was on the mains cable or outside the PA enclosure. I gave him a lecture on EMC and showed him my 10 cm thick folders containing EMC papers and collected publications on TVA and ITV going as far back as 1952. I also mentioned the above-mentioned cases. He thanked me and appeared converted. I hope he won't automatically blame radio amateurs in future.

These five cases clearly show the situation In Australia and what should be done and by whom to overcome EMC problems, education of the public by the DOC (as in DL) and electronic magazines (not only by AR). Adequate legal EMC standards, followed by compliance and service with technical know-how by the industry, would do the job.

6 LOEWE OPTA GmbH WRITES IN *CQ-DL* MAGAZINE (translated by VK2AOU)

We propose the following procedure:

a. It has to be determined that the unwanted effect is not caused by an aerial pre-amplifier (wide-band pre-amplifiers are illegal in West Germany. They must contain band-pass circuits for the television ranges).
b. The television antenna must have a coaxial feed line, and the signal level must be sufficiently high to allow "snow-free" picture reception.
c. It is desirable to have the case investigated by the appropriate Postal- Department Service (there are RF teams in over 70 towns). A copy of the report should be sent to us. If this is not possible, all relevant details of the TVA case should be made available to assist us. If the problem persists after complying with the above conditions, one of our service technicians will be asked to attend to this job and attempt to fix the television at the owner's location. In especially difficult cases the set will be sent by the dealer to our factory, and the Individual set modifications will be carried out in our R and D department laboratory. In this case too, no charge will be made. Please inform the members (55 000) of your club in the appropriate manner, so that in the case of TVA help can be rendered to appliance owners and radio amateurs. Loewe Opta GmbH.

THE HELPFUL *GRUNDIG* COMPANY (translated by VK2AOU from *CQ-DL* magazine 10/1977)

A colour television set, which had been bought in July from the *Grundig* Company (Europe's largest electronic appliance manufacturer) showed TVA in the picture if the transmitter amplifier was used (750 watts maximum permitted). The distance between the transmitting and television antennas was four metres. The case was investigated without calling the Post Office radio inspector. The details were submitted to the *Grundig* company in Nuernberg. I received within two weeks, without "red tape" and free of charge, a high-pass filter, a RF separation transformer (stops RF on the coaxial braid from bypassing this shield) and a mains-line filter with installation instructions. The mains-line filter cured the problem. Holes and space required to install the filter were already provided on the chassis. (Yes, there was a chassis, not just PC boards!). DK1RV, Kreuztal, West Germany.

Court actions would have been a waste of time, money and would have caused bitterness in all these cases, compared with the understanding and able help by the appliance manufacturers.

8. THE HELPFUL RADIO INSPECTORS (they were radio amateurs too)

OST and *CQ-DL* magazines reported several years ago a difficult-to-trace source of TVA. Several attempts and tests by two radio inspectors, with excellent equipment, resulted in

the discovery of a hidden "passive harmonic generator" corrupting a clean amateur transmitter signal. A wide-band antenna pre-amplifier had been disconnected from the power supply (as it, the illegal wide-band type, was no longer required). But it was still connected to the television antenna. The harmonic free amateur signal was picked up by the television antenna. The first transistor of the "cold" pre-amplifier acted as a diode (a non-linear device), rectifying and distorting the clean sine wave signal, thus producing a wide range of harmonics. Harmonics which coincided with the selected television channel on the attached television set, or any other nearby television set via re-radiation, were selected by the pre-amplifier and television set. Removing the unused pre-amplifier solved the problem.

Again, it had been wrong to blame the radio amateur.

We will look next time at the circuit of a 10 year old television set, which includes several features allowing achievement of a very high degree of EMC (immunity to unwanted signals). Readers may compare it with their own television set circuit to see the difference (if any) in design to achieve EMC.

It seems, that the radio amateur's life especially was not meant to be easy — but interesting!

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22. Yeoval. NSW. 2868

It was a pleasant surprise when, on a regular sched with an old friend, three more friends I had not spoken to for some considerable time, broke in to say hello.

That is one of the great things about amateur radio — the friends one makes along the way, whether in Australia or overseas. Perhaps we will meet some of them one day, perhaps not. The bond of friendship is there just the same.

I like to think ALARA members share this bond of friendship, even though it would be virtually impossible for us all to meet together, and even though our circumstances, interests, etc may be widely different.

The first ALARA Get-Together held in September 1984 at Mildura was an outstanding success. Another such Get-Together is planned for 1987. Details will be available early next year.

ALARA CONTEST

The ALARA Contest will be held from 0001 UTC, Saturday November 8, to 2359 UTC, Saturday November 8. Contest rules were in September AR and the Membership List, July AR.

We are hoping for plenty of competition among novice YLs (not necessarily ALARA members) for the *Florence McKenzie CW Trophy,* (featured October AR). Remember, only five ALARA contacts needed to qualify, or eight and a third OMs. (The third could be a little tricky!). If last year is anything to go by there will be plenty looking for you, and anxious to give you those all-important contacts.

Hopefully, this years contest will be the friendly, enjoyable event it has been on previous occasions. Please join us, even if you can only spare a short time to get on air, and if the washing remains piled in the laundry, the dishes in the sink, and the house in a mess, at least you have a good excuse!

Last year we were very pleased that so many OMs showed such a keen interest in our Contest, and hope for plenty of OM participation this year also.

ALARA COMMITTEE

There is one alteration to the ALARA Committee (September AR). The Sponsorship Secretary is Gwen Tilson VK3DYL.

Jessie VK3VAN, has filled this position since 1983, and was ALARA Secretary prior to that. Out thanks to Jessie for all the work she has put into ALARA over the years.

ALARA NET

The ALARA Net on Monday night is still well patronised, in spite of QRN, QRM, and everything in between, plus the difficulty of finding a clear frequency on 80 metres, a not uncommon problem.

Mostly a little patience pays off, and our Monday night nets are an enjoyable occasion.

Even in this day and age I occasionally speak to an OM who expresses surprise at hearing a YL voice on the air. (Where have you been, gentlemen?).

I suppose it is only in recent years that YLs have become more commonplace, and probably were something of a rarity except as suppliers of food and clean-uppers afterwards.

It might be interesting to know what really did start some of our ladies on the road to amateur radio.

This was my experience:

We were living miles from anywhere in a place seldom visited except by bemused travellers who had taken a wrong road and wondered where on earth they could possibly be.

The farmer who owned the property had CB sets in his house, tractor and truck, (in the days when they were barely legal), which proved a very useful form of communication, and it was not long before the OM had one of his own.

For a while I refused to have anything to do with it, but as OM Dan spent more and more evenings with this new contraption, I decided if I did not beat him I might as well join him, and was highly delighted to make my first contact, in Western Australia.

Somehow the rest of Australia seemed a lot closer after that.

Not long after my introduction to CB, we shifted to Yeoval. An amateur radio class started in Wellington, which our eldest son was attending.

I could not get into Wellington to attend the classes, but it sounded interesting, so I obtained the WIA address and sent away for the Novice Kit. What I knew about electronics at that time could have been written on the back of a postage stamp, and it took much study plus pages and pages of written notes before I felt confident enough to try the theory.

CW practice was achieved with my son's help; we each recorded cassette tapes at approximately five words-per-minute, and swapped them, which helped us both in sending and receiving.

To do the Novice Examination, we had to travel to Wagga, some considerable distance from Yeoval, but the nearest available venue at the time. When we arrived at the examination room there were 40 OMs — and me! I think if I had been on my own I would never have summoned up the nerve to go in, but fortunately son and I both passed.

Once again it was back to the WIA, this time for the AOCP Correspondence Course.

It took four attempts at the AOCP Theory, this time thankfully at a local post office, and on my own except for the third attempt, when I was joined by an earnest young man who finished the paper in half the time, and did nothing for my self-esteem by telling everyone afterwards, how easy it had been. (He passed, I didn't!). However, the fourth attempt proved successful, and the CW later in the year finally gave me that elusive "Piece of Paper." What a terrific feeling!

That is all for this month. I look forward to catching up with everyone in the ALARA Contest, and may we have good propagation this year.

—73, 33. Joy VK2EBX.

Try This!

SWR COUPLER FAILURE IN FL2100Z

Den Smith VK5LS
49 Johnson Parade, Blackwood, SA. 5051

The failure of the 10 pF trimmer capacitor (TC201 in the coupler unit board (PC-2056A) of the Yaesu FL-2100Z will result in the destruction of almost all other components on the board.

If such damage does occur, and the components need replacing, a suitable air-spaced variable capacitor to replace TC201 may be difficult to locate.

If this is the case, it appears that operation without the trimmer is possible without apparent effect on the performance of the system.

TECHNICAL MAILBOX

VK3CMC . . . Box Hill, Vic

Craig raises the question of what is the reason for the change in paper and print quality in our magazine (and other electronic magazines), that has occurred in recent months. He notes that, under humid conditions, the ink tends to smear and, in the case of the Call Book, frequent running of the finger down the listings tends to obliterate or smear the print.

Naturally, when the matter was raised at our Technical Publications Group meeting, plenty of suggestions were instantly tendered. We all recognise that AR is widely read, and in some unusual places, but it was considered that reading it in the shower was taking things a little too far! ! !

After the frivolity died down (it certainly was a change from everyone trying to upstage each other picking the most "typos"), the question was posed to our tireless and unsung typesetters, jack-of-all-trades, Betken Productions.

Well, it appears to be just a case of economics and, in part, is a reflection on our times. Paper is most expensive and in not using the finest available, getting the right ink combination is quite an art. You will have noticed that we have opted for a whiter paper which improved the readability and picture quality. However, as I write this, we are caught up in an on- going saga. Due to the recent fire, (refer August AR), we are back to another group of publishers. Be patient with us until Betken cajoles, badgers and "trains" the new people! Yes we know about it and we are doing our very best . . .

Actually, it is all a cleverly arranged plot to sell more Call Books! ! !

VK3 . . . Frankston, Vic

"The transformer grunted, a bright flash came from the PA cage, a whiff of smoke, accompanied by a big bang. As the lights faded, an expensive smell wafted into my nostrils . . ."

Arrh . . . it sure gets the adrenalin flowing, Bob. Strange how seemingly simple tasks, like replacing the final PA tubes in your transceiver or linear amplifier, can lead to such turmoil. Well, is that strange? Let us go back over what most likely happened and put forward some suggestions that may well save you such exciting drama!

Firstly, those new tubes, which you practically had to take out a second mortgage to obtain, may not be as "new" as you were led to believe. Many of the types obtained now-a-days are not exactly a daily production-line product and most likely have been sitting around on the shelves for several years. Don't get me wrong, they are not like tomatoes and deteriorate completely whilst on the shelf, but a few simple precautions may go a long way in ensuring their extended life span. In fact, I have used "brand-new 1945 4CX250Bs" without any noticeable changes to their original design characteristics. However, a few precautionary procedures are necessary.

Here are a few basic tips that may help protect your investment without blowing your budget, or your house fuses. I do not wish to go too deeply into the subject of tube conditioning as employed by the broadcasters, as such detail is beyond the scope of this column, but if any readers wish to write up the subject we would certainly like to publish such an article.

Vacuum tubes, when transported, are sometimes likely to shed particles of cathode material, or in some cases, through less than perfect manufacturing techniques, have material "rolling around" inside the envelope. As we all know, Murphy's First Law of Vacuum Tubes predicts most accurately that such particles will be conductive and reside in the place most likely to cause the most damage; eg between grid and screen, or grid and plate. Tubes left for long periods without use are prone to develop cathode poisoning.

Many readers will recall the *Avo Valve Checker* which was most common in seemingly recent years. (All service people seemed to own one of these vital pieces of equipment). Apart from being able to accurately check the valves, this device could be pressed into service to remove some internal shorts and act as an ad hoc valve conditioner. At least you could determine if shorts were in evidence before you plugged the tube in.

Well, as we all do not have one of these at hand, one approach is to delve into the junk box and try to find a filament transformer and a valve socket. If this attempt draws a blank one may stare ruefully into the rig and contemplate taking the chance . . . All is not lost, let us use the rig.

The first objective is to apply filament voltage only and let the tubes "stew" for a couple of hours, measuring inter-electrode resistances whilst the filaments are on and again when the tube has cooled.

Okay, now let us go about this methodically to avoid risk to life and rig. If the rig is one of the "common garden variety" (FT101, TS520, etc), you will have your plate and screen voltages coming from a single rectifier via a single high voltage winding. The latter voltage is generally derived from a screen dropping resistor. Also, you will have a bias supply. Study the circuit thoroughly and become familiar with the way the voltages are derived. If you are working with a linear, then the same naturally applies, but you may not have the extra screen with which to contend!

It goes without saying — but I will say it — you should first disconnect the power cord from the mains socket. After you have removed the covers and gained access to the PA cage take an insulated screwdriver and short the plate capacitors to ground, the other side of the parasitic choke right back to the HV feed-through. Turn the rig over and do the same thing at the grid and screen pins. Finally, short out all the electrolytics. It is certainly not unusual to run across the bleed resistor being open-circuit. It is a good time to check this now!

Before removing the tubes, take a vacuum cleaner and blow out all the dust from the PA compartment, fan and underside. (This is a job which is best done outside). Remove the valves and repeat (you didn't blow all the dirt into the sockets, did you?). Next, inspect all the components for excessive heating, tell-tale arc-overs, etc. Pay special attention to the neutralising capacitor as dirt in here will surely cause a flame-out of significant proportions. Clean all that you can with adequate quantities of isopropyl alcohol using a tooth brush and clean cloth. If something does not look right, remove it for closer inspection. This is the time to spend a little time to make absolutely sure all is well as it is probably safe to say that the covers have not been removed for some time.

The next step is to disable ***and make safe*** the HV supply and bias supply. ***Disconnect the AC feed to the rectifier and not the DC output.*** Failure to do this may cause the voltage to rise and exceed the voltage rating of the electrolytics which also would guarantee to liven up proceedings! This is also a good time to check the fuses. Ensure that they are of the correct rating and not, as in Bob's case, the mobile replacement DC fuse (20A) installed in the mains feed! (The pedigree of the previous owner of his rig was somewhat questioned).

Now plug in the new bottles and, with all safe, apply the filaments. Let them run for a couple of hours and judiciously measure for any electrode shorts. Try all combinations. Let the rig cool and repeat the measurements.

If you have the misfortune to find a short and the tube is not under warranty it could be worth a try by "flashing" the offending short across a low voltage, high current source, viz one cell of a car battery. A drastic step, but if approached with utmost care, can restore the tube if you are lucky — it is worth a try.

Having satisfied yourself that things are in order, reconnect the supplies. It pays to place the HV tap at the lowest voltage for a while until you are sure things are all well. Before buttoning it all up, it also pays to have a look at the driver coupling capacitor. Some of these little beasties have been known to fail with catastrophic results. The PA tubes do not appreciate 250 volts on their grids! The solution — replace them with two of the same voltage rating, but twice the capacity and wire them in series.

Now turn on the rig and let it thoroughly warm up. Turn off the VOX and wind-off the AF gain. In some cases, also turn down the drive control. The next step could be the re-neutralising of the final. Here you should read your manual and follow accordingly. There seems to be many different ways manufacturers choose to carry out this procedure, many of which fall into what I consider somewhat suspect! Well, whichever way you have to go, it is highly recommended that you check your neutralisation, but remember to readjust your bias for correct standing current as soon as you reach the stage of keying on the transmitter. Finally, keep your drive as low as possible for a day or so before running things flat-chat. Treat the new tubes like a new car — don't thrash them first-off (or ever for that matter!).

Well, that's about it. Many of you may feel that it is "old hat" but there are newcomers among us that may not have known the simple steps as explained above. Certainly, there is a lot more to it and, as those who have been through the tedious tasks of recycling and de-barnacling expensive tubes will testify.

Finally, I hope Bob has been able to locate a replacement transformer or managed to get the old one rewound and by now has it back in place.

To conclude this month's *Mailbox*, a couple of things that I encountered in my shack during the last month which may help someone else.

THE CASE OF THE HIGH SWR

Living in Melbourne, need I say that it was pouring with rain at the time and, whilst checking Sun Noise on 432 MHz I observed a much lower value than normal. Moreover, I was most concerned to find a very high SWR. Putting two and two together, it seemed reasonable to assume that the array had "developed a leak." Not true, dear Henry!

After carefully inspecting the antennae, all seemed in order, but I still had the nagging feeling that it must be up there somewhere. Out came the Noise Bridge (it is a bit special for these frequencies) and, low and behold, the SWR was "spot-on."

To cut a long story short, the problem was with the Bird 43 Thruline Watt- meter. For those with one of these units the trouble was the meter connection to the sampling point. It must have been dirty (although it appeared spotless), for all was cured by cleaning the connection. Instantly, the SWR returned to normal.

Incidentally, a common problem with this meter can occur with the connections between the plug-in sensor and the main housing. The most common fault occurs when the connections to the body of the insert can also cause trouble. The symptom is, intermittent or no readings. Here the cure is to re-tension the connection finger, clean the insert connections and body of both the unit and sensor. The above fault was unusual as it was none of these problems.

My low Sun Noise is yet to be corrected, but it is now a fair bet that the LNA upstairs has gone downhill as they are prone to do with time.

RF GETTING INTO THE KEYBOARD OF AN IBM CLONE

Whilst operating AMTOR or RTTY on 80 or 40 metres, I was getting RF into what seemingly was the keyboard curly-cord interconnecting with the computer. It was so bad that on 80 metres, only 25

watts of RF output would cause total loss of control. Having tried all the normal filtering and grounding techniques on the computer without success, I was faced with what appeared to be a case of removing the mother-board and adding ferrite beads and bypass capacitors. This did not thrill me very much, as those owners of clones will testify!

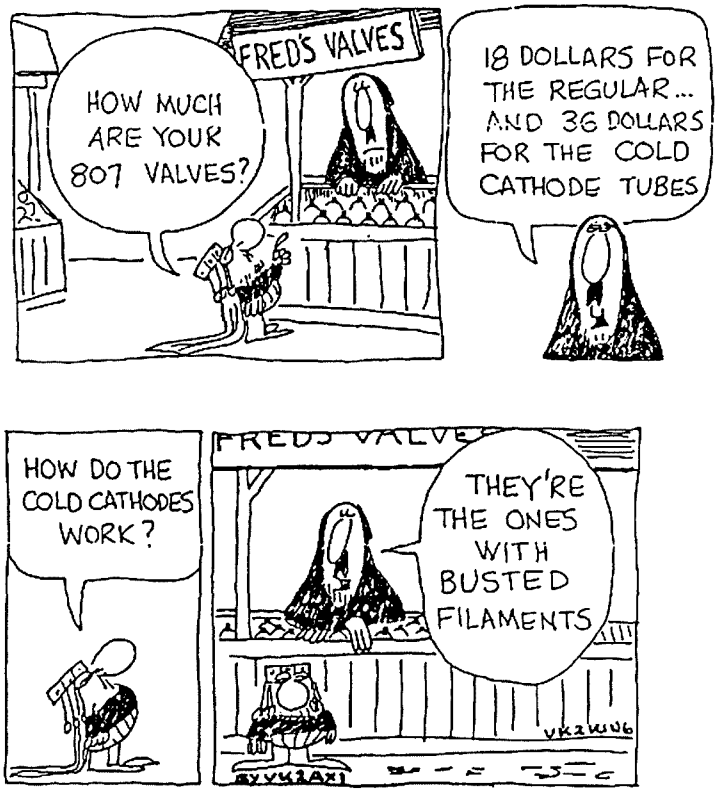
Upon opening the keyboard, it appeared that the curly-cord was not shielded so I went out and bought a length of double shielded cable and a DIN plug. I wired the plug and then reopened the keyboard.

The next task was to remove the wires from an eight-pin, in-line miniature socket. This entailed using a very fine probe to extract the pins. (A terrible task!).

Whilst doing this, pin two seemed to have a somewhat thicker wire than the others — it was shielded cable! Naturally, it was not connected!!! Well, the answer was simple. Scrape the solder resist adjacent to this pin (they already provide the pad) and attach about 150 mm of hookup wire to this point. You will notice that the keyboard has a metal plate onto which the keypad PCB is mounted and also the back cover is another metal plate. Simply solder a spade terminal lug to the end of the wire and another halfway along this wire. (It is advisable to strip the insulation). Clean both covers around the mounting holes (I actually tinned each), and place the lugs over the holes. Lower the back cover down over the lug and replace the screws. What you have done is simply grounded the top and bottom metal plates to the shield. Not a sign of RF is getting into the keyboard now and radiation from the keyboard has all but vanished.

This was not an isolated instance as I have knowledge of several other clones which were configured and responded in the same fashion.

ar



Cartoon courtesy *The Propagator*

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

Over the last few weeks, I have sat through a large number of lectures or talks on a range of topics directly or indirectly related to professional or private interests. All were attending voluntarily.

Some of them were interesting, many informative, and some literally put me to sleep. In the more boring parts I started to make notes on 'dos' and 'don'ts' for lecturers — which I hope I shall remember to check if I am ever required to give a lecture.

A few of these points may be worth mentioning for others who may be asked to fill in an evening.

FIRSTLY CONTENT:

The material should be able to be understood by the audience. This is of course obvious, but may be difficult with an audience of mixed or unknown backgrounds. Many lecturers, usually experts in their own field, cannot come to terms with the lack of specialised knowledge of an average audience. An astute lecturer can assess the audience reaction and adjust the level accordingly. Too low a level, of course, results in boredom instead of confusion.

LENGTH:

There is a limit to how much should be presented in one session. If a long session is necessary, give a few minutes break in the middle, or schedule it is two parts around a coffee break, thus avoiding 'Information overload', stiff joints, and audience discomfort.

QUESTIONS:

It is the lecturers prerogative to decide whether questions will be accepted during the talk, afterwards, or not at all. If accepted, they should be treated seriously, and answered clearly and concisely. It may be necessary to backtrack until a problem is resolved, or offer to discuss the question in more detail personally later.

Incidentally, a lack of questions at the end does not necessarily mean that all is crystal clear to the listeners. They may be totally confused, wary of showing their ignorance, bored, or just more interested in the forthcoming coffee.

VOICE AND MANNER:

There is need for variations in voice pitch and speed. Body movement helps too — anything that brings back the listener's wandering attention. Visual aids such as films, slides and overhead projector transparencies are also useful interruptions to a long talk.

VISUAL AIDS:

These are usually only aids, used to elaborate or clarify the lecture material, not as a way of presenting maximum information in minimum time. They should be relevant, clear, adequately labelled, and legible from all parts of the room or theatre (the whole system should be arranged and checked before the lecture begins).

On the one day I saw OHP transparencies which had been photocopied from poorly printed textbook tables and were almost completely illegible and transparencies that were so well produced that half the audience (mostly teachers) converged on the speaker afterwards to ask how they had been produced. I, for one, remember more of the transparencies than the lecture.

HANDOUTS:

If a lot of diagrams or figures are to be shown, many listeners appreciate copies being made available afterwards. Handouts can also substitute for slides or transparencies.

IN SUMMARY:

The success and value of a lecture is not always in the words alone. The content could be presented on a sheet of paper and we could all go home an hour earlier. Sometimes I feel this would be preferable but a lecturer who is prepared to give thought to the manner of presentation as well as the content is more likely to receive a second invitation.

Best wishes to all those sitting for the November examinations. Remember to read the question and all the answers too!

—73 Brenda VK3KT

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

I hate to have to open the column with news of more intruders, but information received from IARU Region 1 reports the following:

"Despite Resolution 641 of WARC 1979, three more broadcast stations have appeared in the 7.0-7.1 MHz band. (i) Radio Iran, 7.075 MHz (and 9.400), 1830 to 1930 UTC; (ii) Radio Damascus, 7.085 MHz 1800 and on (III) Trans-World Radio (Monte Carlo) 7.100 MHz, 1800 UTC."

Fortunately, these are Region 1 observations, and may or may not cause interference to amateur stations here in Region 3. We hope they don't!

JUSTICE METED OUT?

Gib W7JIE, the Region 2 Monitoring System Co-ordinator also has news for us this month. Gib reports that he has information to hand that the USSR operates over 2 000 jamming stations, with a personnel allotment of 15 000 people to run the machines! ! I No wonder we run across so many jammers in our travels around the bands.

On a lighter note, the USSR recently accused Great Britain of jamming some of the Russian transmitters . . . this was denied. Then an investigation by Great Britain clearly showed that the Russian jammers were jamming their own programming transmissions! Poetic justice . . .?

RECEIVED WITH THANKS

July last saw reports received with thanks from VK2s AAB, BQS, PS, QL, G Bradford, VK3XB, VK4s AKX, BG, BHJ, BTW, DA, KHZ, OD, VK5GZ, VK6s JQ, OD, RO, XV, VK7RH, VK8s HA and JF

There were 397 broadcast (A3E) mode intruders reported; 175 CW (A1A); 91 RTTY (F1B); 92 other modes (R7B, J3E, N0N, B9W, P0N-woodpecker), and 57 intruder stations obliged by transmitting their call signs. Plenty of jammers were evident on 40 metres. One USSR station, UK3A, was heard working Russian amateurs . . . one wonders what was going on there?

TRYING TO RECTIFY THE SITUATION

Jim VK8JF, has been reporting for some time now, the activity by stations on 14.051 MHz at about 0210 UTC using CW and passing commercial traffic. Quite regular offenders, and the IW would be pleased to hear from any other amateurs or SWLs who may be hearing these signals. We are at present trying to do something about it. The signals are apparently coming from north-west of Darwin, and may not be apparent in Australian southern States.

If you find yourself hearing strange modes of emission on the bands, and are curious to know what they are, then perhaps I can help. I have a master tape prepared of most of the different modes one is likely to encounter on the bands, and if your send me a blank C60 cassette, I will copy the master on it for you. Although this tape is primarily for use as an Intruder Watcher's aid, it is of interest to anyone who listens around the bands. Send to the address at the head of this column.

HAVE YOU HEARD IT?

If any VK6 operators are hearing a harmonic of station 6WF on 3.600 MHz, I would be pleased if you would drop a line to Bruce Hunt VK6XZ, 59 Pembury Road, Thornlie, WA. 6108. Bruce is the VK6 Intruder Watch Co- ordinator. We like to have reports on local broadcast station interference from several sources to exclude the possibility of spurii/cross- modulation effects on the listeners receiver.

So we seem to have come to the end of another column, and I will finish by saying "take care" and wish you all 73 until next month.

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685 MHz — Summer: 7.064 MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305 MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGMENTS
Contributions this month are courtesy Bob VK3ZBB, Graham VK5AGR, UoSAT Bulletins, and AMSAT-UK's *OSCAR News*.

NEW UOSAT SCHEDULES

—from UoSAT-OSCAR 11 Bulletin Number 54 on September 13, 1986

As promised in previous bulletins, we have reviewed spacecraft operations schedules for both UoSAT-1 and UoSAT-2. From this review, we have decided on new schedules for the satellites. Descriptions of the schedules and the considerations which shape them follow:

Until 1985, switching the downlink data content on either satellite meant loading a new program to the On-Board Computer (OBC) or otherwise commanding the satellite from the ground. Implementation of the schedule depended on UoSAT staff and equipment being available each day to load software to the OBC. UoSAT staff spent a lot of time up-loading software to the satellite.

When Steve Holder joined the UoSAT team, one of his first tasks was to design and implement a *Diary* program to automate the selection and rotation of downlink data contents. This program is now in place on both UoSAT satellites. The Diary can be programmed days, weeks or months in advance, so the schedule does not depend on UoS commanding the satellite every day.

The interests of several groups of "UoSAT Users" were kept in mind during the formulation of the schedule. Stations using the UoSATs as educational aids (or simply to bring satellites to a wider audience), are interested in the *Digitalkers;* those that want detailed data find the Digitalker a waste of time. Many people are interested in the CCD camera experiments. Advanced experimenters would like to get a chance to listen to the UO-2 high-speed downlink or the 2 GHz beacon. These sub-groups within the user community are "contending" for a fixed amount of downlink time.

The engineers within UoS also have needs. Most of them want lots of data from a specific experiment at a specific — but often unscheduled — time. Those involved in the Digital Communications Experiment need access to the UO-11 uplink and downlink on a regular basis and are interested in allowing selected ground-stations worldwide to participate in the DCE network. The schedule has to balance these diverse desires with the capabilities of UO-9 and UO-11.

UOSAT OSCAR-9

UO-9 will be scheduled on a monthly basis.

After asking for comments from the UoSAT user community, we decided to not have a weekly bulletin on UO-9, but to only reload the UO-9 Diary program monthly. As a result, the UO-9 schedule will be more reliable.

The "bulletin" portion of the UO-9 Diary rotation will carry the month's schedule.

The HF beacons on UO-9 will be on every day, depending on the power budget.

CCD pictures will be transmitted on UTC Wednesdays. The pictures will be from the previous Thursday. The Newsflash will carry time and date of the image.

A new WOD survey will begin each day. Some surveys will begin at UTC midnight, while others will be scheduled for equator crossings or other interesting times.

On three consecutive days per week, WOD surveys will include the Radiation Experiment (channel 3) and channel 13 which monitors its high-voltage power supply.

UO-1 will be turned off by the OBC on Thursday afternoon UTC. The UoS ground-station will use the "window" to take CCD pictures, modify the schedule, load "Newsflash" bulletins and (monthly) reload the Diary.

UOSAT-1 SCHEDULE

Saturday	WOD (w/ Radiation Experiment)/ TLM/SKED/STAT
Sunday	WOD
Monday	WOD
Wednesday	WOD/TLM/SKED/STAT
Thursday	Satellite turned off around 1500 UTC
Friday	WOD/TLM/SKED/STAT

HF Beacons — daily
(SKED = Monthly schedule; STAT = OBC status messages)

UOSAT OSCAR-11

The Diary schedule for UO-11 is designed to take advantage of easy up-loading and large memory.

Bulletins including Keplerian elements will be loaded weekly. More frequent updates will be made as necessary.

The Digitalker will be placed in the UO-11 rotation on UTC Wednesdays, primarily for school demonstrations. This will probably not happen until October, because the software must be written and tested. It will be worth the wait, though since the higher deviation on the UO-11 FM downlinks will mean a much clearer Digitalker signal, and the UO-11 Digitalker has a larger vocabulary than that on UO-9.

Wednesday will see both the 70 cm and the two metre beacons on. The 70 cm beacon will carry a mixture of 1200 bit/sec Diary data and 4800 bit/sec DSR data. The DSR data is intended mainly for those testing demodulator designs. We hope that scheduled 4800 bit/sec transmissions will stimulate interest, perhaps resulting in a demodulator design being published and further DSR/CCD time being scheduled.

The 2 GHz beacon will transmit on UTC Saturdays beginning in October. We encourage experimenters to send up reports of the SHF beacon reception.

WOD channels will be selected with an eye toward interesting combinations of telemetry points. UoSAT users should write in with their "WOD Requests."

UOSAT-2 SCHEDULE

Sunday	Diary (WOD/TLM/STAT/BULL)
Monday	Diary
Tuesday	Diary
Wednesday	Diary and Digitalker (when ready) and 70 cm day
Thursday	Load Bulletins during the morning (UTC). Diary
Friday	Diary
Saturday	Diary and 2 GHz beacon

IMPLEMENTATION

The schedule described above is being gradually implemented, and will be completely in place by the end of October. It will then run until January 1987, when we will review it. If you have an opinion about the schedule, let us know by dropping us a line!

LIMITATIONS

The above schedule would, ideally never be interrupted. There are facets to the UoSAT missions, however, which make rigidly-scheduled operation undesirable. Experimenters at UoS are working on the engineering projects that will eventually become UoSAT-C. These experimenters sometimes require operations that cannot be scheduled in advance. Unscheduled operations are most likely to effect UO-2 listeners who hear the satellite at the same time as the UoS Command Station. Generally, if you do not hear the signal you expect on two metres, check the 435.025 MHz downlink. Unscheduled interruptions of the regular two metre schedule in these circumstances will never be eliminated, and we suggest that you make the best of them by listening in on unusual activities on two metres or 70 cm.

Within the above limitations, the new UO-1 and UO-2 schedules will provide a way for experimenters and educators to plan their use of the satellites. The schedules also streamline daily operating procedures at the UoS ground- station, leaving UoS staff more time to pursue experiments with the existing UoSATs and possible routes leading to further low-cost educational and scientific satellites.

Please remember that while we are committed to serving the users of satellites in education and the amateur satellite service, UO-9 and UO-11 are experimental spacecraft and will always be subject to the needs of the experimental payloads which they carry and the engineering experiments on which the UoSAT Spacecraft Engineering Research Unit depend.

UOSAT DECODER PRINTED CIRCUIT BOARD

Jim Miller G3RUH

This decoder was originally published in *Wireless World (UK)* May 1983 issue. The board features the 1200 Baud circuits; ie limiter, phase locked loop, integrate and dump, lock detector and revised output interfaces. Input filter, 300 Baud and CCD line sync detectors have been omitted. However, the design follows the original almost identically, so the 'hookS7 are there if required (though component numbering is different).

Input	Typically 50 mV — 5V RMS audio from an FM receiver.
Outputs	The 1200 Baud serial data stream is output in three formats: 1. RS232C level 2. Regenerated two-tone audio, in UoSAT-2 CUTS tones 3. CMOS level plus 1200 Hz clock and lock
Controls	Input audio invert switch, UoSAT1/ UoSAT2 switch, lock meter
Set-up	Two preset pots — for PLL frequency and six volt supply
Power	Requires 12 volts at about 15 mA

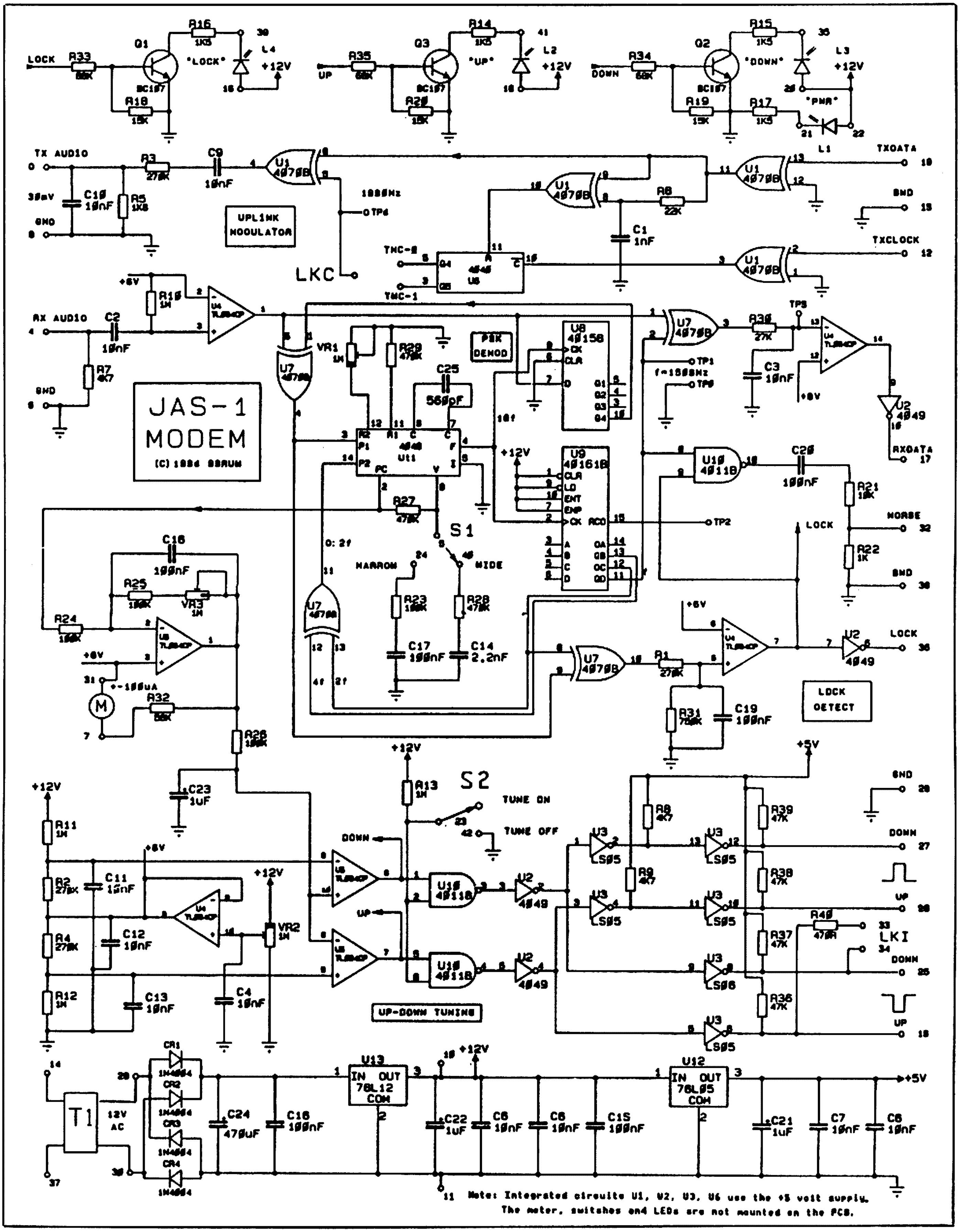
The above printed circuit board and complete article is available from AMSAT-Australia, c/- Box 1234, GPO, Adelaide, SA. 5001 for $35 (including air mail postage). Other than the decoder all that is required to display the data is a computer capable of receiving 1200 Baud ASCII 1 start bit, 7 data bits, even parity and 2 stop bits.

FUJI OSCAR-12 (JAS-1) MODEM PRINTED CIRCUIT BOARD

Jim Miller G3RUH
Extracted from AMSAT-UK's *OSCAR News* Number 61 September 1986

To use the JAS-1 (OSCAR-12) satellite's digital mailbox you need an AX.25 Terminal Node Controller (TNC) system with an external modem replacing the standard TNC's Bell 202 internal modem. (See *OSCAR News* Number 60 July 1986, page 30). Automatic doppler shift tracking is virtually essential.

The complete circuit of a suitable modem is shown. Full instructions (eight pages) are available


JAS-1
MODEM
(C) 1984 BBRUN
UPLINK MODULATOR
PSK DEMOD
LOCK DETECT
UP-DOWN TUNING
LOCK
UP
DOWN
"LOCK"
"UP"
"DOWN"
"PWR"
TX AUDIO
RX AUDIO
TXDATA
TXCLOCK
RXDATA
MORSE
GND
LKC
LKI
S1
NARROW
WIDE
S2
TUNE ON
TUNE OFF
T1
12V AC
78L12
78L05
+5V
+12V
+6V
Note: Integrated circuits U1, U2, U3, U6 use the +5 volt supply.
The meter, switches and LEDs are not mounted on the PCB.

OSCAR-10 APOGEES — NOVEMBER 1986

			SATELLITE			BEAM HEADINGS					
			APOGEE	CO-ORDINATES		SYDNEY		ADELAIDE		PERTH	
DATE	DAY NO	ORBIT NO	UTC HHMM:SS	LAT DEG	LON OEG	AZ DEG	EL DEG	AZ DEG	EL DEG	AZ DEG	EL DEG
1	305	2546	1331:09	-11	212	352	62	22	60	61	47
2	306	2548	1250:11	-10	203	15	62	40	55	70	39
3	307	1550	1209:14	-10	193	35	58	53	49	77	31
4	308	2552	1128:16	-10	184	50	52	64	41	63	22
5	309	2554	1047:19	-10	1174	61	44	72	33	88	14
6	310	2556	1006:21	-10	165	70	36	78	25	93	6
7	311	2558	0925:24	-10	156	77	28	84	17	96	-2
		2559	2104:55	-10	331					263	-1
8	312	2560	0844:27	-10	146	83	20	90	9		
		2561	2023:58	-10	322					268	7
9	313	2562	0803:29	-10	137	88	12	95	1		
		2563	1943:00	-10	312					273	15
10	314	2564	0722:32	-10	128	93	4				
		2565	1902:03	-10	303			267	4	279	23
11	315	2567	1821:06	-9	294	265	1	272	11	285	32
12	316	2569	1740:06	-9	284	270	9	278	19	292	40
13	317	2571	1659:11	-9	275	276	17	284	27	302	48
14	318	2573	1618:13	-9	266	282	25	292	35	314	55
15	319	2575	1537:16	-9	256	289	33	301	43	332	60
16	320	2577	1456:16	-9	247	297	40	312	50	353	63
17	321	2579	1415:18	-9	237	307	48	327	55	17	62
18	322	2581	1334:21	-9	228	321	54	345	59	36	58
19	323	2583	1253:24	-9	219	338	59	6	59	51	51
20	324	2585	1212:26	-8	209	359	60	26	57	62	44
21	325	2587	1131:29	-8	200	20	59	42	52	70	36
22	326	2589	1050:31	-8	191	37	54	54	45	77	27
23	327	2591	1009:34	-8	181	51	48	64	38	82	19
24	328	2593	0928:37	-8	172	61	41	72	30	88	11
25	329	2595	0647:39	-8	162	70	33	78	22	92	2
28	330	2597	0606:42	-8	153	76	25	84	14		
		2598	1946:13	-8	328					266	0
27	331	2599	0725:44	-8	144	82	17	89	6		
		2600	1905:16	-8	319					271	8
28	332	2601	0644:47	-8	134	88	8	95	-2		
		2602	1824:18	-8	310					277	16
29	333	2603	0603:49	-7	125	93	1				
		2604	1743:21	-7	300			270	5	283	24
30	334	2606	1702:23	-7	291	268	2	276	12	289	33

OSCAR-10 APOGEES — DECEMBER 1986

			SATELLITE			BEAM HEADINGS					
			APOGEE	CO-ORDINATES		SYDNEY		ADELAIDE		PERTH	
DATE	DAY NO	ORBIT NO	UTC HHMM:SS	LAT DEG	LON OEG	AZ DEG	EL DEG	AZ DEG	EL DEG	AZ DEG	EL DEG
1	335	2606	1621:26	-7	262	274	10	282	20	297	41
2	336	2610	1540:28	-7	272	279	18	288	28	308	48
3	337	2612	1459:31	-7	263	286	26	296	36	321	54
4	338	2614	1418:34	-7	254	293	33	306	43	339	59
5	339	2616	1337:36	-7	244	302	41	318	49	360	60
6	340	2618	1256:39	-7	235	313	48	333	54	21	59
7	341	2620	1215:41	-7	225	327	53	352	57	38	54
8	342	2622	1134:44	-6	216	345	57	11	56	52	47
9	343	2624	1063:44	-6	207	4	58	29	53	62	40
10	344	2626	1012:46	-6	197	24	55	43	48	70	32
11	345	2628	0931:49	-6	188	39	51	55	41	76	24
12	346	2630	0850:52	-6	179	52	44	64	34	82	15
13	347	2632	0809:54	-6	169	62	37	71	26	87	7
14	346	2634	0738:57	-6	160	69	29	78	18	92	-1
15	349	2636	0647:59	-6	151	76	21	84	10		
		2637	1827:31	-6	326					270	1
16	350	2638	0607:02	-6	141	82	13	89	2		
		2639	1746:33	-5	317					275	9
17	351	2640	0526:04	-5	132	87	5				
		2641	1705:36	-5	307			268	-2	280	17
18	352	2642	0445:07	-5	122	92	-3				
		2643	1624:38	-5	296			273	5	286	25
19	353	2645	1543:41	-5	288	271	3	279	13	293	33
20	354	2647	1502:43	-5	279	277	11	265	21	302	41
21	355	2649	1421:46	-5	270	283	18	292	29	313	48
22	356	2651	1340:49	-5	260	289	26	301	36	328	54
23	357	2653	1259:51	-5	251	297	34	311	43	345	57
24	358	2655	1218:54	-5	242	307	41	324	49	6	58
25	359	2657	1137:56	-4	232	318	47	339	53	25	55
28	360	2659	1056:59	-4	223	333	52	357	55	40	50
27	361	2661	1016:02	-4	214	351	55	15	53	52	44
28	362	2663	0935:04	-4	204	9	55	31	50	62	38
29	363	2665	0854:07	-4	195	27	52	45	44	69	28
30	364	2667	0813:09	-4	185	41	47	55	38	76	20
31	365	2669	0732:12	-4	176	53	41	64	30	81	12

for an SASE from AMSAT-Australia, c/- PO Box 1234, GPO, Adelaide, SA. 5001. Printed circuit boards and a kit of parts are also available from the same address. At the time of writing, the estimated cost of the PCB was $50 and about $25 for the additional kit of parts.

Brief Description

MODEM: Downlink — Receive audio PSK demodulator to TTL digital, 1200 BPS. Uplink — 1200 BPS Manchester encoding modulator to microphone level, transmit audio. Receive carrier LOCK LED indication. Selectable loop bandwidth. Morse code (CW) regenerated tone output.

CONNECTS: to AX.25 TNC "modem disconnect" jack. Suitable for TNC-1 or TNC-2. Only four connections — TXData, RXData, TXClock, Gnd.

DIGITAL AFC: tracks changing doppler shift via the Up/Down signal lines for your receiving rig. Designed for all known Icom, Trio and Yaesu standards. Adjustable for 10-100 Hz/step. Positive pulses, negative pulses and Icom bi-level. Tracking ON/OFF switch. Manual tuning indication by LEDs and/or centre-zero meter.

POWER: AC mains PSU built-in or 12 volts AC input or 12 to 14 volts DC, 20 mA.

PCB: High quality 160 x 100 mm double side, plated through, legended, with full alignment and installation instructions. Standard CMOS and LSTTL used. No hard-to-get parts.

JAS-1 MODEM PARTS LIST

Resistors 5%

R1-R4	270k
R5	1k8
R6	22k
R7-R9	4k7
R10-R13	1M
R14-R17	1k5
R18-R20	15k
R21	10k
R22	1k
R23-R26	100k
R27-R29	470k
R30	27k
R31	750k
R32	56k
R33-R35	68k
R36-R39	47k
R40	470k
R41-R42	47k

Capacitors

C1	1n 10%
C2-C13	10n 10%
C14	2n2 10%
C15-C20	100n 10%
C21-C23	1u 16V tant
C24 **	470u 25V
C25	560 p 5%

Integrated Circuits

U1,7	4070 Quad Exor
U2	4049 Hex Inverter Buffer
U3	74LS05 Hex Inverter OC
U4-U5	TL084 Quad op-amp
U6	4040 12 stage divider
U8	4015 four bit shift register
U9	40161 Divide by 16 (MC14161)
U10	4011 Quad 2 Input Nand
U11	4046 Phase Locked Loop
U12	78L05 five volt regulator
U13	78L12 12 volt regulator **

Semiconductors

Q1-3	BC107 etc (ordinary NPN)
L1-4	LED 10 mA *
CR1-4	1N4004 etc **
D1-2	1N4148 etc

VR1-3 1 M trimmer ⅜" square, flat mounting: eg RS 187-321, Dubilier D79-30, A-B E2B Bourns 3386F, Spectrol 63-M

Sundries

M1 ±100 uA meter * eg RS 259-549, Farnell 143-510

S1-2 SPDT toggle switch *

T1 12 volts 3 VA transformer ** eg RS 297-829, Farnell 141-471

TP0, 1 ,2, 3, 4 test points

Terminals

1-42 for external connections as required. Can also use 0.1" pitch SIL connectors. Max set (1 x 2-way, 5 x 3W, 1 x 4W, 2 x 5W, 1 x 10W)

LKC, LKI made from hook-up wire

Modular PSU 12 volts 100 mA ** RS 591-281, Farnell 147-545

NOTES:

* The meter, LEDs and switches are not mounted on the board.

**Power supply components T1, CR1-4, C16, C24, U13 (or modular PSU) are omitted if external stabilised 12 volts used.

CAPACITORS:
560 pF 0.4" (10 mm) pitch ±5% polystyrene
1n-100n 0.2" (5 mm) pitch ±10% dipped ceramic or polyester 63-100 volts typical
470 uF 25 volts electrolytic 1.0" x 0.4" (25 x 10 mm) approx

RESISTORS:
Carbon film 0.25 or 0.5 watt, 0.4" (10 mm) pitch
Integrated circuits U1, U2, U3, U6 use the +5 volt supply
The meter, switches and LEDs are not mounted on the PCB

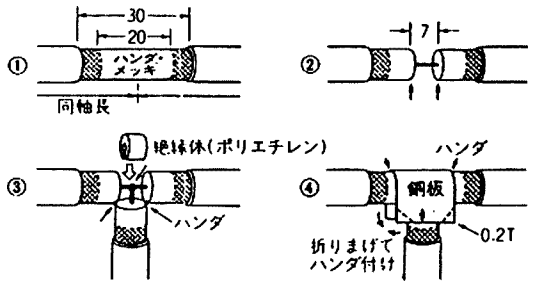
TRAP FILTER FOR JAS-1 (J-mode)

by JA5COY and translated from CQ #7, p.348 by Keith Wilkinson ZL2BJR

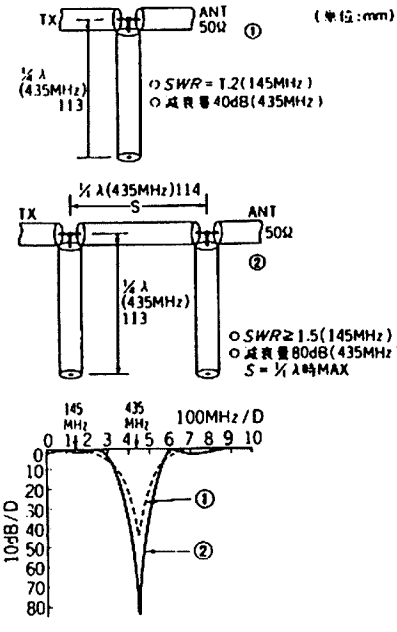
For JAS-1 J-mode, you transmit in the 145 MHz band and receive in the 430 MHz band. The 430 MHz receive frequency is not exactly the third harmonic of the 145 MHz transmit frequency, but there can be problems such as intermodulation or receiver desensitisation. These problems can be eliminated by adding a low pass filter (LPF) or band pass filter (BPF) to the transmitter to reduce the level of the third harmonic by 100 dB (from 10 watts to -60 dBm). If the harmonics are 60 dB below the fundamental (as the regulations say they should be) then the LPF or BPF needs to supply at least 40 dB of attenuation. To eliminate receiver intermodulation due to strong local signals, it is also a good idea to use a filter at the receiver input.

This article describes suitable transmit and receive filters.

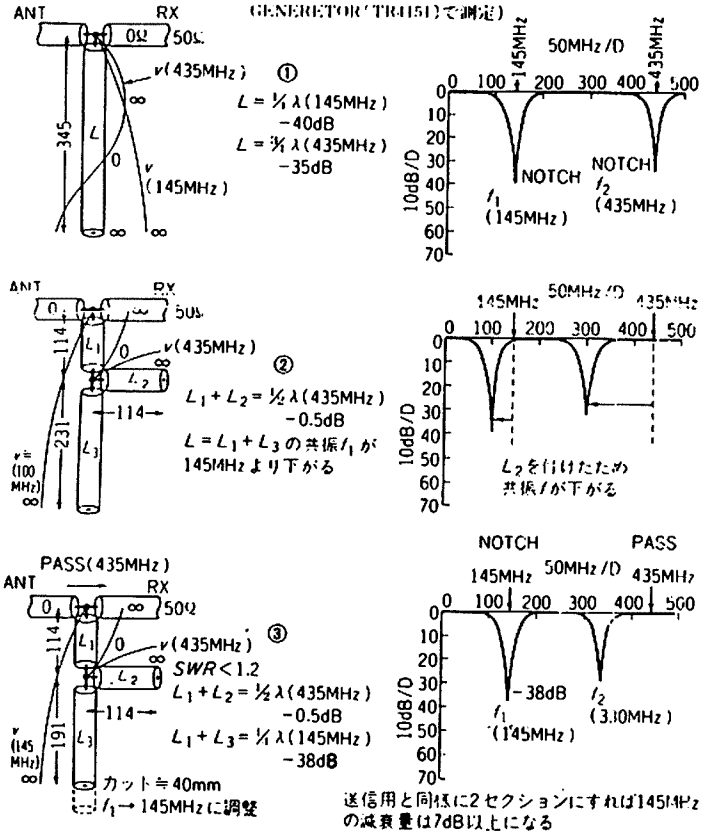
第11図　UHF帯で望ましい同軸ケーブルの接続方法(5D(5C)-2Vの場合)
(コネクターは使用しないこと、損失が大きい)



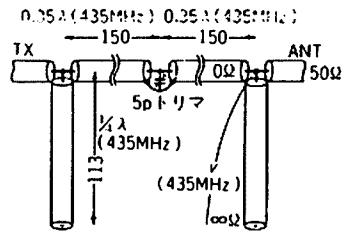
第12図　435MHz同軸オープン・スタブ



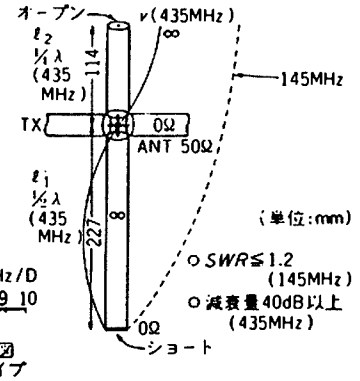
第15図　435MHz同軸オープン・スタブの改善
(スペクトラムTRACKING SCOPE(TR4110) & GENERETOR(TR4151)で測定)

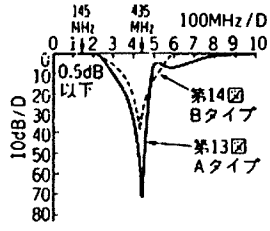


第13図　Aタイプの接続



第14図　Bタイプの接続





Transmit filter (435 MHz notch)
A single quarter-wave open stub for 435 MHz connected in parallel with the feeder (Figure 12 (1)) gives 40 dB attenuation at 435 MHz, and 1.2 SWR at 145 MHz. Using two such stubs spaced a quarter-wave apart gives 80 dB attenuation and 1.5 SWR. Spacing two such stubs at 0.6-wave gives attenuation of 70 dB and 1.1 SWR. The circuit in Figure 13 (with 0.7-wave spacing) gives attenuation of 70 dB, and SWR can be adjusted to 1 with the 5 pF trimmer. If about 40 dB attenuation is sufficient, use Figure 14.

This combines a quarter-wave open stub and half-wave shorted stub (at 435 MHz). The combination (quarter-wave plus half-wave) acts like a quarter-wave shorted stub; ie parallel resonant circuit, at 145 MHz, so SWR is virtually unaffected (under 1.1).

Receive filter (145 MHz notch)
A quarter-wave open stub for 145 MHz looks like a three-quarter-wave open stub on 435 MHz — loss on both bands is 40 dB (see Figure 15 (1)). For Figure 15 (2), L1 plus L2 equals half-wave open stub at 435 MHz, (loss is only .25 dB), but the loading due to L2 causes the resonant frequency of L1 plus L3 to fall to 100 MHz. Trim L3 for resonance at 145 MHz (see Figure 15 (3)). SWR is 1.1. These filters can be built inside your rig if space permits — this will not affect filter characteristics.

Constructional cautions
Dimensions in the figures are in millimetres.

Use 75-ohm coaxial cable for the stubs — for high Q and high attenuation.

Connect the stubs as per Figure 11:

1 Measure from centre of joint. Tin the centre 20 millimetres of braid.
2 Use cutter; do not cut wire.
3 Solder braid where it touches, cover joint with sheath.
4 Wrap with copper foil and solder.

SATELLITE ACTIVITY FOR THE MONTH OF JULY 1986

1. LAUNCHES
The following launching announcements have been received:

1986-050A (16849)	Cosmos 1761	July 05	USSR
1988-051A (16855)	Cosmos 1762	July 10	USSR
1888-052A (16880)	Cosmos 1763	July 16	USSR
1988-083A (16861)	Cosmos 1764	July 17	USSR
1986-084A (16874)	Cosmos 1765	July 24	USSR
1986-088A (16881)	Cosmos 1766	July 26	USSR
1986-058A (16883)	Cosmos 1767	July 30	USSR
1986-057A (16868)	Molniya 1-67	July 30	USSR

2. RETURNS
During the month 45 objects decayed including the following satellites:

1975-067A	OSO 8	July 09
1966-022A	Soyuz T-15	July 16
1966-0046A	Cosmos 1760	July 03
1966-051A	Cosmos 1762	July 24

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Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED RECENTLY

DXCC PHONE
348 Ray Dobson VK5DI

DXCC OPEN
234 David Jewell VK0DJ
235 Bert Lower VK5AOL

WAVKCA
1500 Donald Simmonds K5BDX

Congratulations are extended to David, on the first WIA DXCC from mainland Antarctica, so far as the records show!

ALGOA BRANCH AWARD

This award is available to any amateur who submits proof of contacting stations in at least four of the eight categories listed below. Endorsements will be issued for any further categories contacted.

Categories
1 Any member of the Algoa Branch of the SA Radio League operating in the Eastern Cape*.
2 ZS1, ZS2, ZS4, ZS5 or ZS6. Republic of South Africa.
3 ZS3 Namibia.
4 H5 Bophuthatswana.
5 S4 Ciskei.
6 S8 Transkei.
7 V9 Venda.
8 7P Lesotho, 3D6 Swaziland or A2 Botswana.

All contacts must be made on or after January 1, 1986 and may be in any mode on 160, 80, 40, 20, 15, or 10 metres.

The award is issued free of charge.

Applications, with QSL cards, should be sent to: The Awards Manager, Algoa Branch Award, PO Box 10050, Linton Grange, 6015 Port Elizabeth, Republic of South Africa.

** Members are: ZS2s — A, AAE, BE, C, DJ, DO, F, G, HH, HV, JC, KG, KU, MD, NC, NH, OC, OE, RN, SM, SP, U, UI, W, WM.*

MELLISH 87 DXPEDITION

An Australian-American Effort
The following is a letter from Ken Keenan K4ADN, 8609 66th Street North, Pinellas Park, FL 33565, USA. Ken is soliciting support for an anticipated DXpedition.

I would like to form or participate in a DXpedition to Mellish Reef in August 1987.

Mellish Reef is approximately 804 km off the north-eastern coast of Australia at 17.25 degrees south, 155.5 degrees east. It is uninhabited except for crabs and the like, and has a maximum elevation of two metres above sea level. It is a DXCC country — VK9M/Mellish Reef.

My preliminary thoughts regarding Mellish 87 — subject to feedback received as a result of this letter — are delineated below:

Semi-round-the-clock, 5-7 days operation, plus or minus propagation and the number of operators.

Operators to be 3-10 in number, to include bands and modes preferred by the operators. I operate 20 metres SSB; other individuals with that inclination are needed.

Operator's equipment, but we may be able to arrange some equipment from manufacturers. Gasoline-powered generator, fuel for same, and linear amplifiers to be arranged in Australia.

Transportation will be in two phases: My personal plans are to bring my wife to Sydney, leave her there with friends, and then fly to Cairns for the boat trip to Mellish Reef.

Each operator would assume his own travel expenses plus an equal share of the common expense. Common expenses include boat transportation to/from Mellish, provisions for the stay there, generator/linear rental, etc. My guess at operator expenses that are common is $2000 per operator, to be revised as we get better data.

An Australian volunteer is badly needed to help with Government Clearances/Call Sign, and exploring the Cairns/Mellish boat options.

Florida West Coast DX Ring have volunteered to look after QSL cards.

After receiving responses, I will prepare a tentative schedule for review. That schedule will include a commitment date for operators, at which time part of the expenses will be required to be forwarded to the treasurer. Please include in your responses your estimate of the time required to accomplish the above tasks and your home and office telephone numbers.

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AWARD WINNERS FROM THE US

Mary Duffield WA6KFA, a retired Santa Cruz, CA school teacher, has been named winner of the first "Amateur Radio Ambassador Award" by Advanced Electronics Applications of Lynwood, Washington. The award includes a $1000 prize.

Mary was chosen from a list of 50 nominees for her work encouraging young people to communicate with the world using computers and amateur radio. The award was created with the hope of encouraging radio amateurs to promote the amateur radio service to the public.

The Senator Barry Goldwater Scholarship of $5000 was awarded to William Hulka KA9AKI, of Kokomo, Indiana. William ranked second in his high school class and is an Eagle Scout. He has been a licensed amateur since 1978.

The Perry Hadlock, K2IK Memorial Scholarship of $500 was awarded to Michael Dargel N1AMR, of East Lyme, Connecticut.

The Paul and Helen Grauer Scholarship, $500, was awarded to John Alcorn KA0EMS, of Sedalia Missouri. KA0EMS ranked second in his high school class and is presently attending the University of Missouri at Rolla majoring in Aerospace Engineering. He has been licensed since 1979.

—From *The ARRL Letter*, September 15, 1986

WIA 75 AWARDS

Following are further recipients of the WIA 75 Award.

Certificate No 673 — Bolek SP8JMA
Certificate No 674 — Chairil Hamid YC7DF
Certificate No 675 — H S Yamani YC7DX
Certificate No 676 — Protess One Club YB7ZXX
Certificate No 877 — Abdul Kadir YC7CY
Certificate No 678 — Widjaja Kiharto YC3DSK
Certificate No 679 — Dion Soemardiono YC3JVB

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QSP

RF LIGHTING DEVICES

The ARRL has filed comments regarding FCC proposals to impose radiation limits on radio frequency (RF) lighting devices operating below 30 MHz. This is to ensure that these devices do not interfere with other radio services, including the amateur service.

RF lighting is a new technology in which RF energy is used to produce light. RF bulbs are incidental radiation devices to the extent that a portion of the RF energy escapes into space, with the potential for causing interference.

In 1983, the ARRL Laboratories conducted tests on several of these bulbs which indicated interference signal strengths from S1 to S7 on frequencies from 63 kHz through to 7300 kHz, with the receiver using an indoor antenna a metre from the bulb.

The ARRL believes that the radiation levels of the bulbs tested are considerably less than maximum levels proposed by the Commission in their proposal. The ARRL suggests that the FCC encourage the private sector to produce an adequate set of standards, and that the bulbs carry labels which would educate consumers about the potential interference.

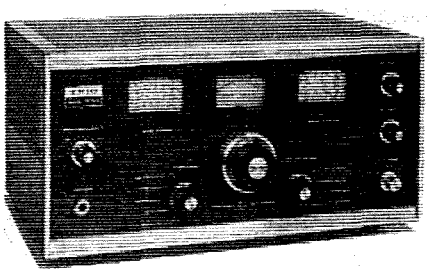
—From *The ARRL Letter*, August 15, 1986

Know your Second-hand Equipment

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

If you have been a regular follower of this series, you will have noted that I have not as yet covered Kenwood equipment. This time I shall attempt to appease the Kenwood enthusiasts.

Kenwood did not come into being until the release of the TS-520 transceiver, about August 1974. Before this time the name *Trio* was used.



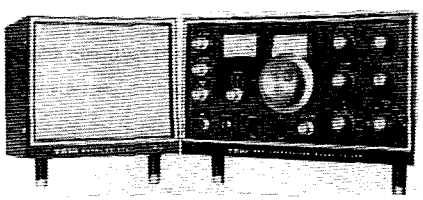
During the mid-1960s, Trio produced several popular general coverage receivers, the best known being the 9R-59 series. These used a basic single conversion set-up with a 455 kHz IF Two tuning dials gave general coverage tuning, plus calibrated band spread on the amateur bands. Even today, these receivers are prized possessions with the listening fraternity, especially broadcast band DXers.

However, they did have their problems with frequency stability and poor dial-readout ability. Dating from the 1960s, they were a tube-type circuit throughout.

Coverage was from 550 kHz to 30 MHz in four bands. A total of eight tubes, plus diodes for AM detector, noise limiter, AGC and power supply, were used. A product detector was provided for SSB reception. Many modifications were published in *Amateur Radio* magazine during the mid-1970 period.

New price for the 9R-59DE in 1967 was $160. The later, but very similar 9R- 59DS was $175 in 1970. Secondhand value today would be about $75 for both models.

The first amateur band SSB/CW transceiver released by Trio In Australia, was the TS-500. It was first advertised in the May 1966 issue of AR magazine.



It was basically a tube design, but did have two transistors in the VFO and one in the crystal calibrator (the crystal was an optional extral). The 80 to 10 metre amateur bands (no WARC bands, of course) were covered in 600 kHz steps. A single conversion setup was used with an IF frequency of 3.390 MHz and a rather basic four-pole crystal filter.

The VFO was followed with a crystal mixer to provide the correct injection frequency. A pair of 6146 tubes were used in the final stage with about 100 watts PEP output. The two major problems with the TS-500 were rather poor frequency stability and the very wide selectivity of the four-pole crystal filter.

The TS-500 was normally supplied with a matching AC power supply, although this was an option and many transceiver were powered from home-built supplies. Another option was an external VFO, the VFO-5, but no DC power supply was available for mobile operation.

In general, the TS-500 was rather overshadowed by the FT-200 transceiver, which offered very much better performance for a similar price.

The new prices of the TS-500 transceiver with matching PS-500 power supply was $576 when first released in 1968. Secondhand value today would be about $175. The external VFO would add another $40.

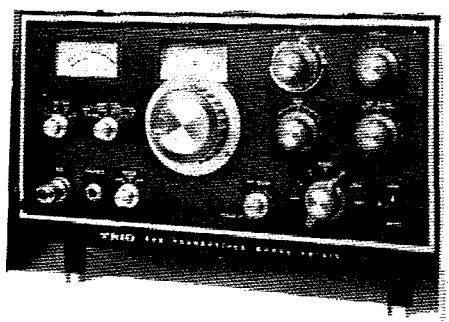
A receiver-only version of the TS-500 known as the JR-500SE was available at the same time as the transceiver. It was an amateur band only receiver and used the same VFO as the transceiver to provide 600 kHz segments on each of five bands with three segments on 10 metres.

A double conversion IF was used with the main selectivity provided by so- called mechanical filters at 455 kHz. Only one choice of selectivity was available for all modes and this was quoted as 3 kHz at -6 dB.

Seven tubes, two transistors and five diodes were used. I have never used a JR-500SE, so I can only speculate at its performance which I imagine would have similar problems as the TS-500 transceiver.

New price was $295 and the secondhand value of this rather rare piece of equipment would be about $100.

In 1971, Trio announced a new transceiver, the TS-510. This transceiver had the same general specifications as the TS-500, but was much improved in the stability and selectivity departments.



By a strange coincidence, it had a remarkable similarity in many respects to the Heathkit SB100 and SB102 transceivers. The IF was the same with a double conversion setup using frequencies of 8.5 and 3.395 MHz.

Whilst it was still basically a tube-type transceiver, a few more transistors were used, compared to the older TS-500. A similar range of accessory items were available which included the AC power supply and a remote VFO. The calibrator crystal was still an optional extra.

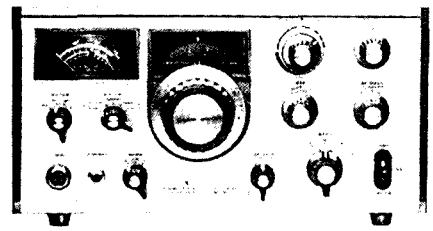
The TS-510 was never widely promoted in Australia, which was rather a pity as it was a very satisfactory transceiver.

New price is not known, but I suspect that with power supply It was in the region of $600. Secondhand value would be about $225, today.

The next transceiver In the Trio-Kenwood range was the TS-511S. I am unaware if any of these were sold in Australial

They were available In the United States about 1972-73. Very similar In concept to the TS-510, but now with 37 transistors, four FETs and one IC. The day of the solid-state transceiver was on the way.

Power output was up to around 200 watts with a pair of 6LQ6s in the final. PEP power input was rated at 450 watts up to 21 MHz and 360 watts on



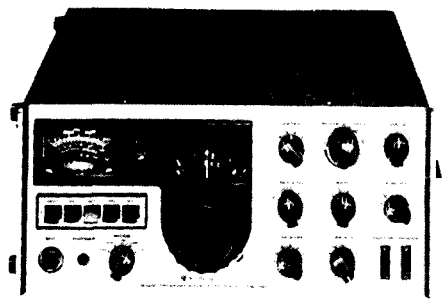
SSB TRANSCEIVER TS-511S

10 metres. This put them into the same class as the Yaesu FTDX-400/401 series.

If you ever find a secondhand unit available, I would suggest a value of about $300 with the matching AC power supply.

The last of the early Trio-Kenwoods to be covered this month Is the TS-900.

Although not common, a few examples are known to exist in this country. The 900 was really the forerunner of the TS-820 and at the time, was the flag- ship of the Trio Kenwood transceiver line up.



Only three tubes were used in the transmitter final and driver stages and these were two 6LQ6s and one 12BY7. The rest was solid-state with no less than 57 transistors, 16 FETs and three ICs. There was no digital frequency display, but the analogue tuning dial was very similar to the TS-820. A high standard of construction was used with plug-in modular boards used throughout. The power supply was still a separate unit — the PS-900 — and a remote VFO was an option.

It is believed that the TS-900 was capable of an excellent standard of performance. Secondhand value today would be In the region of $450 with the matching power supply.

Next time we will discuss later Kenwood HF transceivers from the TS- 520 onwards.

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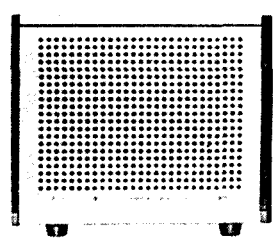
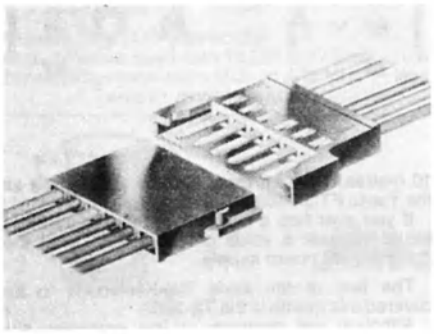


POWER SUPPLY & SPEAKER
PS-511S

A R Showcase



COMPACT CONNECTORS

Utilux have introduced a new, compact 2.0 mm wire-to-wire connector system (in circuit sizes 2 to 10 inclusive) to specifically service the growing areas of miniature and micro-electronics.

Designed by Molex, one of the world's leading suppliers of connectors and modular interconnection products, the system is ideal for a diversity of conditions and situations where tight, compact packaging is essential.

Meeting this criteria, the system is particularly unique in its package width, a remarkably small 2.7 mm, which accordingly coincides with a very light weight.

Such a conservative size/weight combination renders the connector system suitable for a wide range of mini and micro electronic applications. The system can be employed to space-saving advantage in car stereos, word processors, video cameras and security equipment, as well as mobile radios and telecommunications equipment.

The system's contacts are tin-plated and of the high pressure variety, with gold plated options also available.

This wire-to-wire connector system further expands the company's broad capacity to meet state-of-the-art needs in the electronics industry.

Further information may be obtained from Utilux Pty Ltd, 14 Commercial Road, Kingsgrove, NSW. 2208. Telephone: (02) 50 0155.

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COMPACT DISC PLANT TREBLED TO TAP WORLD MARKET

Plans for Australia's first manufacturing facility for compact discs due to be in operation by March 1987, have been significantly upgraded to capitalise on the world-wide shortfall in compact disc production which is forecast to continue well into the 1990s.

Details of the decision, which will see an Australian company become one of the largest producers of CDs in the world before the end of next year, were announced in Sydney by Disctronics Limited.

These plans will see the company more than double its planned investment in Australia's first compact disc plant, which will be located in Melbourne, from $18 million to $38 million and the annual output of compact discs will rise from a planned five million units per annum to 15 million per annum.

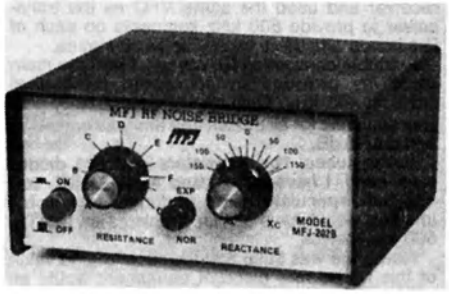
In addition to the music recording industry, compact discs have important new applications in the electronic data storage industry. One disc has the capacity to store the equivalent of 150 000 printed pages or 1200 standard five and a quarter inch floppy discs - equal to a complete 26 volume encyclopedia.

It is believed by many industry observers, that CD-ROM (Read Only Memory) technology can make existing on-line data bases largely obsolete.

NOISE BRIDGE FOR MEASURING WIDE Z-RANGE

The MFJ-202B Antenna Noise Bridge is capable of measuring resistance, reactance and impedance into the region of thousands of ohms.

Most noise bridges allow only measurements in the tens or, at most, hundreds of ohms, which generally becomes inconvenient, particularly when working with wire array-type antennas. The MFJ-202B incorporates a specially designed 'Range Expander' which allows it to read up to 3800 ohms resistance, and capacitive and inductive reactances of up to 1900 ohms.



The noise bridges have a very high accuracy as they are individually factory calibrated before despatch from Starkville, Mississippi.

Using the unit in conjunction with an appropriate receiver over its operating frequency range of 1 to 100 MHz opens up a whole new world of tuned circuit measurements.

Some of the useful tasks covered in the MFJ-202B's manual are: Finding Antenna Resonant Frequency, Cutting a Halfwave Dipole to Frequency, Tuned Circuit Alignment, Measurement of RF Amplifier Impedances, RF Transformers and Baluns, and Capacitance and Inductance Measurement.

For further information or a brochure contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. (03) 873 3777.

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TALK THROUGH YOUR EAR

The Ear-Mike is a unique combination earphone and microphone which enables the wearer to receive, and transmit by using the voice energy detected in the ear canal.

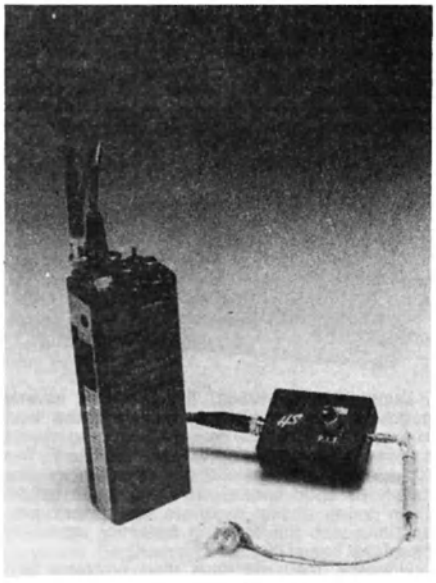
Human speech is generated from the Larynx (voice-box) and an extremely small amount of this energy in the form of air movement is carried to the ear drum causing it to modulate.

The EM-200 Ear-Mike, developed by Sydney-based Hayden-Spike Co Pty Ltd, uses a specially designed audio transducer which detects the voice energy in the ear canal.

The transducer comprises a high impedance coil having a DC resistance of about 1 000 ohms (preferably higher) and has a magnet movable relative to the coil by a diaphragm, fixed either to the magnet or the coil.

Of a similar size to a hearing aid earpiece, the transducer is held in the ear by a hollow casting — just the same as is used to seal a hearing aid earphone to an ear.

The earpiece can also be adapted to fit in, or adjacent to, the ear — and when used with ear protectors, provides the answer to difficult communications in noisy environments.



The EM-200 Ear-Mike and Interface Unit.

In the case of personnel wearing breathing apparatus, such as firefighters, the Ear-Mike solves their communications problems.

The unit has a small interface which goes between the transducer and a hand-held type radio. This black-box, usually worn on a belt alongside the radio, contains a two stage amplifier powered by a 1.5 volt cell and has a press-to-talk function.

The Ear-Mike was awarded a gold medal at the *Exposition of International Inventions* in Geneva, 1984. It is now used by defence departments, security services, law enforcement agencies, emergency services, aviation authorities and private enterprise.

Hayden-Spike is now developing another export potential product — a digital encryption (scrambler) device for portable radios — which can be programmed with up to six billion different encryption codes.

—Submitted by Jim Linton VK3PC

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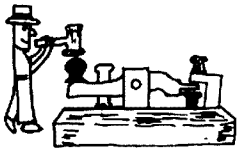

Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

This month sees the inauguration of what may become an annual (or even more frequent) event — the National Sprints. Contesting in Australia has been going downhill over the last few years, at least from the point of view of one who has found it more difficult each year to run up a few numbers in the RD and the John Moyle. Did I read correctly that there were only 175 logs submitted in the 1986 Field Day? There were 24-hours to compete with 174 other stations. Here are the major criticisms of contesting in Australia, partly based on my own experiences and opinions, but reflecting the attitudes of other amateurs who have written and discussed the subject with me.

1 There are only three national HF contests — the RD, the John Moyle and the Novice — and each of them is crippled by some special parameter. The RD is on a WIA Divisional basis with scoring handicaps, the John Moyle penalises any operator who is not portable and the Novice penalises the full-call.
2 There are too few amateurs participating (see 3 and 4 below), particularly in CW sections.
3 The rules are too complex and serve to frustrate the operator and limit activity. Examples are the restrictive classes in the John Moyle, the inability to work anyone but VK/P29/ZL outside ones own area in the RD, and the limitations on multiple contacts on HF
4 The periods are too long.

The purpose of the National Sprints is to address all of these problems so that those who enjoy contesting have the best possible opportunity to do so in a truly competitive environment. Much can be said for and against contesting in principle, but a good contest provides real opportunities for sharpening operating skills, which will stand one in good stead if ones services are ever required in an emergency. Besides, it is (or should be) fun.

The CW Sprint will take place from 1200-1330 UTC, November 15, 1986, with the Phone Sprint over the same period a week later.

All CW operators are urged to participate in the CW Sprint and prove once and for all that it is not lack of numbers, interest, skills, or enthusiasm that have resulted in such low numbers participating in the major contests.

Also, I hope any "slower" operators or those uncertain of their skills will not be discouraged from participating. To this end I would remind all of you Brass Pounders that, if a slower station calls, you should go back at the same speed. Therefore, you slower ops should have no hesitation in calling the faster operators.

One last comment — because the Sprint is restricted to an hour and a half on 80 metres, it is fair to say that we will need a reasonable portion of the band, particularly in view of the fact that the novice allocation only includes 10 kHz (3.525-3.535 MHz) of the portion restricted to CW-only by gentlemen's agreement. We may have to put up with some flack from phone operators who think that 3.535+ is exclusive phone, but do not let it worry you.

Now, it might be appropriate to review some of the finer points of CW contesting. The following paragraphs will form a general introduction to the subject, and, I hope, encourage some otherwise timid souls to get their feet wet in what should be a valuable educational and practical exercise — the First National CW Sprint.

There are some fringe benefits to participation in a CW contest which make it attractive to the non-contesters among us — you can experience a wide variety of sending styles and speeds in a very short time, and significantly improve your "ear" or copying ability while you are at it. As with any contest, the basic point of the Sprint is to make as many contacts as possible, as fast as possible. Therefore, contest exchanges are cut down to the bare bones. The Sprint contest exchange requires call sign, signal report (RST), and a serial number. It will look something like this:

(Station 1) CQ TEST DE VK9ABC K — or (CQ SPRINT DE VK9ABC K)
(Station 2) DE VK5FN K
(Station 3) DE VK5NBG K (two stations have responded)
(Station 1) VK2DXP NR 5 N N TT8 BK
(Station 2) QSL UR NR 5NN 132 BK
(Station 1) R GL E E VK5NBG NR 5 N N TT9 BK
. . .

There is not much to it, is there? And, when you consider that most of these exchanges take place at 20-30 WPM, or faster, the contact rate can be very high indeed.

Looking at the sample exchange piece by piece, the first element is the CQ Contest Call. The call should consist of the CQ TEST or CQ SPRINT, followed by your call sign and K, sent once only. Allow only three or four seconds for a response before repeating.

The answer to a call should be simply DE followed by your call sign. This presumes that, if you answer on the same frequency, you must be answering the CQ. But be sure you are on the same frequency (see the *ARRL Handbook or Pounding Brass*, August 1983).

The station calling CQ should send the responding station's call sign once (because there may be several stations answering) and will then give the signal report and serial number. Repeats are usually not given unless requested. Signal reports are usually given as 5/9/9 regardless of the facts of the matter, and I shall refrain from making any further comment on that subject aside from noting that reports were not even required in the 1985 RD.

Nines and zeros are coded because they are so common (N=9, T=0), so an exchange of 5/9/9 008 would be sent as 5NN TT8. The break signal BK (— . . . — . —) is then sent to invite the other station to transmit. Often it is sent as B (space) K, and sometimes K is used by itself. Sometimes, the break is preceded by "QSL?".

The second station then sends "QSL UR NR 599 132 BK".

As is the case in phone contests, it is up to the station which called CQ to send any pleasantries, such as GL E E, and he may or may not listen for an acknowledgment (E E) before calling the other station (if he copied both call signs), or calling CQ again.

Unlike most CW activities, successful participation in a contest does not depend to any great extent on your copying speed for "normal" CW. You can generally work a station calling CQ at twice to three times your normal copying speed. Firstly, the format is so standardised that all you have to pick out is a call sign and a number. You can listen to two or three calls before answering in order to be sure of the call sign; you can listen to the next contact the person makes in order to verify the number. Secondly, asking for a repeat is as simple as sending a question mark. For example, if you missed the number, you send "NR? K." Finally, although you may start out listening to CQ calls three or four times, it does not take long before you can pick them up first time. It is generally recognised that any five words-per-minute novice can recognise a single character at speeds up to 50 WPM; a string of three or four characters at 25 WPM is not difficult.

As far as sending speed is concerned, you should send as fast as you can and still be readable at the other end. But as I have said before, slow down to match a slower operator, or you will waste valuable time in repeats. If you want a contact (why else would you be in the contest?), be patient.

By all means, have a go at the Sprint, and I look forward to exchanging numbers with you.

73 till the 15th.

ar

Radio Amateur Old Timers Club

John Tutton VK3ZC
11 Cooloongatta Road, Camberwell, Vic. 3124

WINTER QSO PARTIES

The Winter VK/ZL QSO Parties took place on August 11 (7 MHz), and August 18 (3.5 MHz), the former in very poor conditions. It was quite an achievement to record a contact even in one's own call area, and a ZL was really something!

Consequently, very few saw out the whole period of the party, and it was as good as over by half time.

VK3JA, on CW only, had the most QSOs (15), while VK3VF (14) had it most on combined modes. Most of the SSB operators gave in to the QRN.

On 3.5 MHz, it was a much better picture with skip troubles being negligible, but still some QRN — the main trouble was people forgetting the Party was on!

VK3JA was top again with 24 QSOs, this time on CW and SSB. VK3YW with 12 QSOs was top CW-only.

Discussions are in train with ZL regarding next year's Parties and you will be kept posted in these columns of any changes.

	7 MHz		3.5 MHz	
	QSOs	TOTAL	QSOs	TOTAL
VK3JA	15	600	24	1060
VK3VF	14	490	18	900
VK3KS	12	360	21	840
VK3XB	12	360	21	840
VK4AIX			18	720
VK4OX			18	640
VK3YW	4	80	12	360
VK3XF	8	160	13	325
VK7RY	6	120	12	300
VK2AWA	5	50	10	250
VK3RJ	10	250	9	135
VK3ZC	10	250		
VK3AMD	8	160		
ZL3BJ		100		880
ZL2US				490
ZL2AT				420
ZL1DO				350
ZL1LR				300
ZL4AI				300
ZL1JX		75		235
ZL2AB		50		225
ZL2BD		250		
ZL2BU				140

Check log received from VK5KV

ar

Club Corner

GOLD COAST AMATEUR RADIO SOCIETY

The Ninth Annual Gold Coast Hamfest will be held on November 22, 1986, from 9 am to 6 pm. The venue will be the Albert Waterways Complex, Broadbeach, near Jupiters Casino and Pacific Fair. This year's Fest will be bigger and better than ever. Everyone welcome.

—Contributed by Ken Ayres VK4KD, Chairman Organisation Committee, Gold Coast Annual Hamfest

DEVIL NEWS from the North-West

Last meeting saw 22 members and four visitors, one being VK7NAE from the North. It was good to welcome Owen VK7OL, back from his 3-4 month tour on the "big island." Owen and his wife, Nancy had a most enjoyable holiday.

The repeater, VK7RAD, on 146.625 MHz is now on site and operational. The repeater is run by solar power and is being turned off at night because the cold weather turns it on and leaves it running all night. Andrew VK7ZAP, turns the repeater on prior to going to work in the morning and off again at night. This on/off routine will continue until he has time to go to the site to make some adjustments to the unit. These adjustments have to be made when the temperature is minus-four degrees, so it is going to be an unpleasant task. If the repeater is abused to the extent that it is unable to be used or normal use, it will be turned off completely until the adjustments are made! A special thanks is extended to all the amateurs who have participated in the repeater project.

Greg VK7ZBT, was most embarrassed when someone let the "cat out of the bag" and the members sang Happy Birthday to him.

Further discussions took place in reference to Camp Quality, and a committee has been formed. Further information may be obtained from John VK7ZPT, Noel VK7EG or Tony VK7AH.

The club station has still *not been on-air from its* new QTH, as members have had other commitments, however it is hoped things will be underway shortly.

The club realised $100 from the auction mentioned in last month's column. As this was so successful, there will undoubtedly be another one the future.

Arthur VK7SE, is in need of operators to do News Broadcast Relays — volunteers please contact Arthur.

QSLs are still very quiet.

The evening concluded with a most interesting computer display provided by VK7s RN, MB, NAE, ZAP, KAB and AH. Each had different programs and some had printers and disc drives.

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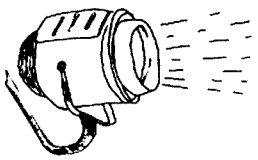

Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Well, 1986 is rapidly drawing to a close. What a year it has been for me personally. Little did I realise just 12 months ago that my life and status would radically alter. It has been an interesting, but disappointing year, as far as the radio conditions are concerned. It is taking longer to get out of the trough of the current Sunspot Cycle, although I think we are slowly climbing upwards.

By now propagation on the higher frequencies will have improved, allowing signals from Europe and the Middle East to come in during the late evening hours. Hopefully, conditions on 10 and 15 metres will also pick up, I am certainly looking forward to trying them from my new QTH in West Launceston. I am writing this in mid-September, so I have not had time to fully evaluate its potential. I have been encouraged so far, with observations made from a trap marine vertical antenna.

It is interesting to note the difference between vertical and horizontal polarisation on propagation. I do hear signals much earlier on the vertical than on the G5RV, while the horizontal is superior on signals much closer to Australia. It is very interesting to make comparisons between the two.

There has been a consistent rumour going around that KYOI, in Saipan, is reportedly being sold to the "Christian Science Monitor." You may recollect that this organisation has had plans to commence a shortwave broadcasting service from a site within the Continental US. KYOI mainly broadcasts pop music to Japan. This station got into financial difficulties, because the expected commercial sponsorship did not eventuate, so they have appealed on-air for the listening audience to send in donations to keep it going. They have raised US$20 000 from this unusual source of fund-raising, still not enough to meet KYOI's debts. At deadline time, KYOI was still there on 15.190 MHz with its usual staple of "rock" with announcements in Japanese and English. Thanks to Arthur Cushen and the *DX Post* for the above information.

According to a report on *Media Network* from Jonathon Marks at the ERATO Electronics Fair in Amsterdam, Kenwood will be releasing a new table- top communications receiver, either later this year or early in 1987. The R5000 model will reportedly have 100 memories plus keypad tuning with an optional speech synthesiser. Price quoted was about US$1000. Looks as if Sony and Icom are going to have some stiff competition to their models that have similar features.

Just a few weeks ago, I took my R70 receiver down to our holiday home at Weymouth, which is located on the northern coast of Tasmania. Predictably, I was able to hear many more signals, particularly on the medium frequencies, away from the strong local stations on 1.008 and 1.098 MHz. I was fortunate in hearing, what I suspect was an American MW station on 1.120 MHz, with pop music. There were plenty of others also with pop music, but I was unable to ascertain where in the Pacific they were located, although they were not Australian or New Zealand stations, because they were on 10 kHz steps. Plenty of Asian signals as well were audible, under domestic AM stations. 1.440 MHz provided quite a number, as no Australian stations are allocated there. Later on, the powerful 1200 kW sender in Saudi Arabia is easily heard, even on a transistor portable.

Yet another highlight for me was the reception of long-wave signals. That is the broadcasting stations that are allocated between 150 and 300 kHz, mainly located in Europe and the USSR. There was a signal on 236 kHz with the *Mayak* program, the second Soviet domestic network. By checking with the current WRTH, I was able to *ascertain* that it was located in Siberia with a power of several thousand kilowatts.

So I tuned down even lower to see what else I could hear. Imagine my surprise to hear TTY tones on 145, 137, 134 and 127 kHz respectively. They were not strong but there was little OSB. If it had been HF breakthrough on the R70, I would have noticed the rapid QSB. These presumably are military signals with high power.

But it did not end there, as there were consistent TTY tones around the clock on 45 kHz. The other TTY senders were usually observable in the evening hours, yet the 45 kHz signals were consistently there. Then it dawned on me — the Navy has been transmitting on that channel for *many years from Belconnen*, Australian Capital Territory. So I have been surprised by the performance of the R70 on the LW bands in remote locales well away from nearby MW senders. Hopefully, in the future, I shall be able to go on another "DXpedition" and really enjoy listening.

Before I do forget, I have received a request from two international broadcasters for technical reports of their broadcasts to Australia. Both have been experiencing difficulties and would welcome critical reports on their transmissions. The first one is Radio Veritas in Manilla, Philippines. This station recently acquired some new senders to replace the previous ones, which were sabotaged by pro-Marcos forces during the revolution earlier this year.

They are at present on in English twice daily. From 0130 until 0155 UTC on 11.730 and 15.275 MHz and at 1500 to 1530 UTC, they are on 9.565 and 15.120 MHz. They are especially keen to get reports from Australia on their new transmitters. Their address is:

Radio Veritas
English Service
PO Box 939
Manilla, Philippines.

The second station requiring assistance with reception reports is the External Services Division of All India Radio. They are broadcasting to Australia from 0900 until 1000 UTC and at 2045 until 2230 UTC and these transmissions are a part of the General Overseas Service. The frequencies for the evening schedule are 11.810 and 15.335 MHz while the morning release is on 9.550, 9.910 and 11.715 MHz.

Reports should be sent to the Director of External Services, All India Radio, PO Box 500, New Delhi, 110001, India.

The BBC External Services have given Marconi Communications Systems a contract to supply equipment and antennas for their new relay in Hong Kong. It is due for completion earty next year and will improve the audibility of the BBC World Service in northern and eastern Asia. The transmitters will be 250 kW incorporating *Pulsam* modulation and will have remote control via a digital data link. There will be four multiband curtain arrays with mode/slew switchings. This should give DXers a chance of obtaining a new country before the Territory reverts back to China in 1997.

Well, that is all for this month. Until next time, the very best of DXing and 73.

—Robin VK7RH

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RETIREMENT

Roy Neal K6DUE, (seen on Australian television particularly during the "Amateur in Space" has announced his retirement from his position as West Coast Bureau Chief of NBC Network News.

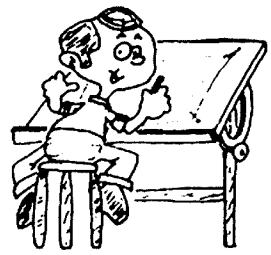
Although he will remain with NBC on a consulting basis, Roy plans to devote much of his time to making personal appearances and lecturing on the space program and allied topics.

In addition, he plans to be involved in various television projects through his own company "Talent Connections." Included will be at least one new production on his favourite subject: Amateur Radio.

—From *The ARRL Letter*, September 15, 1986

CLUB PORTRAIT

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131



GIPPSLAND GATE RADIO & ELECTRONICS CLUB

Formed by radio amateurs in the Dandenong area of south-east suburban Melbourne, in 1977, the Gippsland Gate Radio Club, in June 1986, changed its name to include the word *Electronics* and moved in a new direction.

While keeping its original aims of promoting amateur radio in all its forms, the Club has now included the fields of digital electronics and computers. A Club information bulletin states: "The hobbies of radio and digital electronics are inseparable and we now provide the opportunity for hobbyists and experimenters in each field to expand their horizons."

GGREC Publicity Officer, Kerry Clayton VK3KFC, says there was a falling interest in club activities among local radio amateurs with a general trend of non-participation. At the same time there had been a narrowing of interest toward computers among the Club's 20-odd remaining financial members. Despite considerable effort the Club was unsuccessful after 12 months of trying to recruit newcomers into the hobby of amateur radio.

The GGREC's committee carefully analysed the state of amateur radio, where the future was heading and how best to reshape the Club in line with perceived trends.

Kerry says that among the Club's members there are some very talented people in the computer field and most, if not all, have computers and are heavily into RTTY, both glass and mechanical. He says a decision was made to streamline the committee and broaden the Club out into the electronics field.

Kerry says; "There is an incredible interest shown by school children, and teenagers, in the electronics and computers so we figure we will try to attract them and convert a few along the way to amateur radio." He says it is a two-way thing — the existing club members will also learn from the youngsters — in the schools the children teach the teachers about computers, now!

He considers the era of electronics and computer hobbyists among youngsters has not been generally recognised by the amateur radio fraternity.

GGREC is going out into the community (including visits to other clubs) and using whatever media it can to make itself known as a club for anyone interested in computers, electronics or radio communications.

Kerry says, "We are certainly going into the field — offering ourselves to retailers for in-store promotions of their products and publicising the Club at the same time."

He admits the drive behind the public relations activity is one of survival — the Club's future viability depends on it. Kerry also says he believes the bottom of the sunspot cycle, with its poor top end HF propagation has contributed to the lack of interest in amateur radio. The amateur radio fraternity must be prepared, he warns, to take advantage of any increased interest in radio communications, such as through CB radio, when readily available HF DX returns.

The Club ran test transmissions in 1984 to check propagation for a planned six metre repeater, but this project waned due to transmitter problems, however, it is the GGREC's long-term aim to get the project going.

A highlight of the GGREC calendar is the Alexandra Apex Club Cross-Country Horse Trial in April each year. The Club is famous for the communications facilities it provides for the event held in very rugged mountain country near Rubicon, in northern Victoria. This includes check-point reports safety communications and a computerised results service.

GGREC has clubrooms in the 1st Oakwood Park Scout Hall in Heyington Crescent, Dandenong, which includes its club station, VK3BJA, and a test equipment library. Some members also have access to test equipment which they make available.

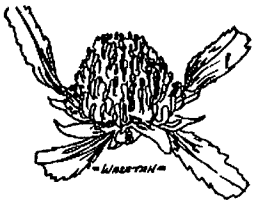
Help is always there for anyone who wants to build a kit, (and there are many now available through various sources) or to rescue someone having difficulty in making a construction project operational.

GGREC publishes a bimonthly newsletter called *Gateway*, and membership is concentrated on a line between Dandenong and Oakleigh, with a few living in Cranbourne. However, where you live does not matter, if you think the Club suits your interests the GGREC will greet you in a warm friendly manner as either a visitor or member.

Meetings are held at 8 pm on the third Friday of the month, chosen purposely to avoid clashing with other metropolitan clubs which usually meet on the second and fourth Fridays.

Visitors are made most welcome or inquiries may be made to Kerry Clayton, PO Box 98, Dandenong, Vic. 3175 phone (059) 96 3580.

Write an Article for AMATEUR RADIO!



VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

BROADCAST NEWS

On September 14, VK2WI changed their 160 metre frequency to 1.845 MHz. This has removed it from the Band Plan DX segment. We have found that even with two broadcasts on Sunday there are some who do not hear either. To assist those unable to hear a broadcast, a recorded message will be available on the Dural telephone from Monday to Saturday; (02) 651 1489. It will be about two minutes duration, with major points from the Sunday broadcast. It is based on a similar service provided by the RSGB to their members.

NEW COUNCIL MEMBER

Due to changed circumstances, Mary Jane Douglas VK2CMJ, was unable to continue on Divisional COuncil. Her position for the remainder of this year will be filled by Mike Burns VK2AUE.

NEW MEMBERS

We would like to welcome the following who joined the Institute during September. E A Brennan VK2FLP, Lemon Tree Passage and E J Lawer VK2NNJ, Keiraville.

COMING EVENTS

The *Conference of Clubs* is being held on Sunday, November 2.

The next *Trash and Treasure* sale will be held at Amateur Radio House on Sunday afternoon, November 9, at 2 pm.

The next *Divisional Seminar* will be held about March 1987.

DECEASED ESTATES

There was fair response to the items in *Hamads*, September. There was one error — the receiver shown should have read FRG 7700. Because of the error it is being re-offered. Condition is fair with some slight marks on the case. Tenders for this item will be received at the Divisional Office up until 2 pm on Thursday, November 13.

WICEN

A new repeater for 7150 has been assembled by Jeff VK2BYY, for Chatswood. This is now in service. The site is starting to be built out with the continued development of the region.

DATA SHEETS

We have recently been able to obtain several data books from which we are able to offer members a photocopy service. Written requests only, maximum three devices and include a 50 cent stamp to cover postage costs. Further details are given on the Broadcasts.

ROSS HULL CONTEST

See the Contest Manager's comments in recent ARs. This contest needs the support of VHF/UHF operators If it is to be continued.

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VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

RALLY AUSTRALIA AWARD

The Redcliffe Radio Club has devised a very new concept in amateur awards. You can claim this award by making a trip around Australia without leaving your shack. With the price of petrol these days, that will make it very attractive.

For full information regarding this award, please see page 45, September AR.

QUEENSLAND NETS

Further to the list of nets *in* Queensland:

RADARS Net: Roma and District Radio Society, 3.610 MHz, Friday at 8 pm, except the third Friday of each month.

Mount Isa and District Amateur Radio Group: 3.610 MHz, Tuesday at 8 pm, VK4WII.

Brisbane Amateur Radio Club: 28.445 MHz, Monday at 7.30 pm, VK4BA.

Sunshine Coast Amateur Radio Club: 3.595 MHz, Thursday at 7.00 pm, except when Christmas Eve, Christmas Day, *or* New Year's Eve falls on a Thursday. Call sign of the control station is VK4WIS.

A watch is kept on 28.400 MHz for five minutes also. The Club makes every reasonable effort to vacate 3.595 MHz before 7.55 pm, so as not to cause interference to the Oxley Radio Club (VK2) and the Bendigo *Radio Club* in VK3, who begin nets at 8 pm on or about this same frequency.

Amateurs in other parts of Queensland and in other States can take advantage of these nets to collect points to the various club awards.

—Bud VK4QY

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VK3 WIA Notes

NEW MEMBERS

The following applications were received for the month of August 1986, and were accepted by Council on August 28, 1986.

Christopher Avram VK3YCA; Robin Brading VK3KRB; Jack Burgesson; Cleaver Duell VK2MUA; Ian Harrison; B Kiernan VK3PHK; Thomas Lee; Sakari Mattila OH2AZG; Richard Orford; Evan Vogele; and Anthony Linton.

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EXAMINATIONS

The next DOC examinations will be held on Tuesday November 18, however the last day for applications to be submitted to the Department was October 8.

Examination and closing dates for 1987 are as follows:

EXAM	CLOSES
February 17	January 8
May 19	April 8
August 18	July 8
November 17	October 8

QSP

PHASING OUT OF VNG AUSSAT TO TAKE OVER?

We hear from authoritative sources that the well-known time signals on 4.5, 7.5 and 12 MHz are to be discontinued from the end of October. Users from many services have come to depend on VNG. In particular, 7.5 MHz is a prime calibration frequency for all electronic equipment. No notice of the impending shutdown has been given to most users.

The station which has transmitted these time and frequency standard signals is located at Lyndhurst, near Melbourne, Victoria, on the site where the transmitters of the High Frequency Inland Service are also located. The antennas occupy a large area owned by the Commonwealth. The land has been rural, but it is becoming residential and is situated on a four lane highway.

Telecom, who provide the transmitters for the ABC, have been reviewing the need for the VNG service, since the advent of AUSSAT satellites has mads the HF Inland Service redundant. Telecom itself no longer has any need for VNG, but is willing to provide a replacement time and frequency service to those who may still require it. This will be over its normal landline circuits at normal commercial rates.

The authorities claim that VNG is now superfluous and obsolete. However, other organisations are invited to take over if they perceive a continuing requirement, but it is pointed out that updating to a new "state-of-the- art" transmitter may cost up to $1.5 million. The annual cost of operation and maintenance is estimated at $100 000. Telecom considers it uneconomic to continue the service on the present frequencies when alternatives are available.

But what alternatives are economically available to amateurs, yachtsmen, light aircraft operators, and others dependent on accurate time signals and frequency calibration references?

Comments have been requested from a small list of users or potential operating successors (all Government departments) but on a time scale such that the average small user has not even had time to learn of the impending shutdown, let alone assess the situation and supply adequate information to the authorities.

The well-known time, propagation and frequency services station WWV in Boulder, Colorado, and its subsidiary WWVH in Hawaii faced a similar fate a couple of years ago. Many protests from amateur, marine and other services convinced a Senate Committee to reconsider. It was persuaded that the service was of benefit to all users, was a necessity, and could be a lifesaver, particularly for mariners calculating their positions on the high seas. Consequently, the WWV/WWVH service still exists.

We appeal to the Minister for Communications, the Hon Michael Duffy MP, to reconsider and allow VNG to be heard on its present frequencies at least until adequate notice is given by appropriate gazettes and newsletters. Please allow sufficient time for interested parties to reply regarding the retention of a service essential to the Pacific and Indian Ocean areas. Your concurrence in granting an extension before its extinction may save lives at sea. Without this service many who depend on it for accurate time are "flying blind." We feel that much more forethought should have been given to its deletion, and that all present users should be given time to register their comments.

NEW TEN-TEC TRANSCEIVER

The new amateur HF transceiver, called the Paragon, will be available in 1987, and will cover all amateur bands from 160-10 metres and receive continuously on all frequencies from 100 kHz to 30 MHz.

The rig will contain dual VFOs, plus offset receive tuning, a speech processor, noise blanker, full or semi-breakin, notch filter, passband tuning, and an audio filter.

There will also be a 62-memory capability and will operate CW, SSB and AM. FM capability will be optional.

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

I think the last week in August and the first week in September should have been designated "Community Involvement Fortnight" in VK5 this year. We really stretched both our volunteers and resources to the limit but in both cases the events undertaken went off without a hitch.

The events were, of course, the WICEN communications provided for the State Bank Discovery Trial (Round-the-State-Car-Rally) and the Display Station and allied events at the Marion Library to celebrate the centenary of the Marion Council District. I will not give a full report here as John Hampel VK5SJ (Marion) and Bill Wardrop VK5AWM (WICEN) will be doing that in a forthcoming issue of AR. (I believe John has booked several pages in advance, and our thanks to Maria VK5BMT, for volunteering to do the typing).

Actually, it is at times like these that you discover who your true friends are and it is a wonder that I am still talking to John Hampel! On one of the days that I spent down there helping to operate the Display station, after a hard day talking, both on and off the air, I climbed wearily into my car to discover a parking sticker under my windscreen wiper (this in a private car park between the Library and Council Chambers). On reading it, I discovered it was not a legitimate one, but one making rude remarks about my parking ability (which I might add were quite unfounded!). It was not until several days later that I discovered that John was the perpetrator.

Not content with that, at the reception which the Mayor of Marion gave for those of us involved, John said a few words in answer to the short speech which the Mayor made thanking us for our involvement. Before I realised what was going on John had "... invited the President of the South Australian Divi. . . . .to say a few words." (no word of warning beforehand). So (clutching at straws) I spoke about how we as amateurs like to feel that we can put ourselves and our equipment to good use for the benefit of the community in general.

This may not be true of everyone but I feel that it is true of the majority and was certainly in great evidence with the WICEN activity and the Marion Display. As for John, well, how can you stay mad with someone who put in so much time and effort both planning and manning the show?

The Around-the-State 'hook-up' on the Tuesday evening, when mayors from all around South Australia congratulated the Mayor of Marion, via amateur radio, as did Mrs June Appleby, MP, the Member for Hayward, was one of the finest pieces of net controlling and organisation that I have ever seen — congratulations John, and thanks.

Out thanks also go to Bob Murphy VK5MM, (better known as Mickey Mouse, and one of our Life Members) who hosted Mrs Appleby, Doug Head VK5NDH, (who was our official photographer for the evening — thanks Doug), and myself, in his shack. Thanks again Bob, and now that we know the rig works, we look forward to hearing a lot more of you on the air.

The WICEN event created a monumental headache for both the two principal characters. Bill VK5AWM, our WICEN Director, had to find amateurs to operate all the rally checkpoints, many of which required four-wheel drive vehicles to get to them. Joy VK5YJ, on the other hand, only had to get people to drive as far as Hindmarsh to operate the Base Station. The catch was that she needed enough people to cover a period of 24 hours for eight days. No mean feat! I mean to say, where *do* you find people mad enough to volunteer to sit up all night; I was still wondering this as I watched the sun *rise* as I drove home on Tuesday morning, having shared the shift with Joy and my son, David VK5ZHB. I also wondered what the neighbours would think as I arrived home at 6.30 am!

To all those volunteers, whether they did the night shift or the day shift; to all those who drove 100s or 1000s of km, sometimes in the rain or freezing cold. To those who lost sleep or gained blood-pressure worrying over the organisation; to all those people right across the State who were involved in either of the two events and to John VK5SJ and his team, who put together the displays and events connected with Marion, we say a huge —

THANK YOU!

DIARY DATES

November 1 — Buy and Sell, an all day event at Westbourne Park Community Hall, Goodwood Road, Westbourne Park. Organised by the Adelaide Hills ARS.

November 15 — National Sprint CW Section.

November 22 — National Sprint Phone Section. (It is only for one and a half hours on each date, so why not be in it?). Annual Picnic, no information at time of going to press, so keep your oar-tuned to the Sunday Morning Broadcasts.

November 25 — General Meeting (also no information available at time of going to press).

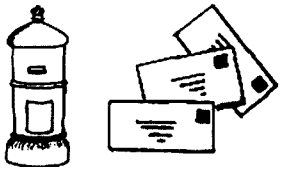
December 9 — Christmas Social at 7.45 pm. "Looking Back at Radio in SA — and audio history." Produced and presented by John Hampel VK5SJ and Gordon Welsh VK5KGS, with the help of Kevin Kitto and the Glen Lea Singers. To be held at the Woodville Community Hall, Woodville Road, (between Port Road and the Council Chambers). Bring your lady and a plate of food.

JUBILEE 150 AWARD

Firstly, a correction and an apology. In an earlier list I said that Certificate No 329 was issued to VK2XV. I am not sure where I got that call sign from, but it is definitely my error as Certificate 329 was issued to Les McIntyre VK3XF My apologies Les, and I hope that it did not cause you too much inconvenience or embarrassment. Now for the latest award winners.

485	VK2APE	490	VK2VYS
493	VK5NSI	494	VK2DUP
497	VK4SK	498	VK3ABP
502	VK1DW	504	VK4KHZ
507	VK2PKW	510	VK5ZAH
513	VK5BWF	515	L20508
518	ZL4QX	519	SWL/ ZL1-261
520	VK3SM	522	VK2MUZ
524	SWL/ C Holz	525	KJ4SY
526	XE1JIW	527	L50126
528	KE5VH	529	NG8Z
530	K0CNM	531	N7GWA/ VE3
532	CP5LE	533	KA5WAD
534	KA5WAC	535	VE4ANA
536	W0LEO	537	WN5W
538	N6OBW	539	N8FXL/ M8
540	N7ILF	541	KB4AQI
542	KA9TIA	543	K6KYN/ 7
544	WA2PJI	545	VE3FII
546	KA5PGE	547	WA5Q
548	WA0GUD	549	WD4RAF
550	KA9UVK	551	KA9UCX
552	K4IOT	553	W0HNW
554	WB7TUY	555	N0GMB
556	K5QXY	557	KA9LZP
558	K5LVZ	559	KA5AYJ
560	W6ENZ	561	KB4NRZ
562	W6UVW	563	WA2REC
564	N0FRT	565	ZL1NU
566	WA2RXS	567	W7VIH
568	KD0VY	569	K5TLP
570	W4LQF	571	KA7CPZ
572	KB5AID	573	KA5OOC
574	N5HWI	575	N6NLA
577	PY2ZJ	578	LU1CIZ
579	CE1FGT	580	9Y4MJK
581	PY2ZBO	582	W7NTM
583	N8GUD	584	WA8BIJ
585	N3ASJ	586	K2CZT
587	KB2AYK	588	WF-MOJ
589	WA8IMF	590	KD9HK
591	KA2FAJ	592	W5KMZ
593	WB5OGD	594	N1BTE
595	KA5UAA	596	N0HJF
597	KA9TCR	598	KD9JB
599	AA4ON	600	KA1LLH
601	KA1LXT	602	KF5DX
603	W8IWJ	604	K1VNS
605	KF5HZ	606	KA1BLP
607	W5UOM	608	N5JHI
609	WD8REC	610	CE6GDN
611	W0ZRA	612	N4KWV
613	KE5ES	614	N9EZV
615	VK3PHK	616	VK5GAS/ 2nd Op
619	VK4VR	620	VK2EXA
621	WD5CUG	622	N5APB
623	N8CKV	624	KA7YPD
625	N1DYN	626	KA5MIJ
627	KA1HUS		

ar



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

JUST A LINE . . .

Just a line to say you put out a fine magazine.
73,

Ed Rumming ZL1TG.
ar

CHUCKLING ENJOYMENT

I enjoyed the article on Direct Conversion Receivers by VK3XU. It is a long time since I built a receiver.

I chuckled at the answers given in *Technical Mailbox*. Might as well be gossiping over the garden fence. . .The reader knows almost exactly what the writer said. Good show!

Yours, 73,

Don Law VK2AIL,
RMB 626 Adelong Road,
Tumblong, NSW. 2729.
ar

DISCUSSION PAPER

With reference to the recently published Linton-Harrison paper on future trends in AR and the replies which followed; many readers seem to have overlooked the possibility of allowing digital modes on the Citizens Band Radio Service (CBRS). Instead of reducing the levels of entry into the amateur service to increase membership, why not allow the "Computer Whiz Kids" to discover two-way radio the cheapest and easiest way.

The small percentage who would be potential amateurs will soon discover the differences between both services. If AR information is available via computer bulletin board services and published in computing magazines the exposure would give us the boost in numbers we require.

The CBRS consists of 40 channels using AM/SSB at 27 MHz and a further 40 channels using FM at 476-477 MHz. Experience on these bands goes a long way in preparing users to enter our 10 metre and 70 cm amateur bands.

I believe the expense of advertising would be minimal compared to the administration problems of new licence-grades, examination syllabuses, band plans, etc. A minor change by DOC to CBRS conditions of use to include digital modes would appear to be the logical answer.

73,

Steve Stephens VK4KHQ,
PO Box 2154,
Mount Isa, Qld. 4625.
ar

INCREASE OUR NUMBERS

Over the past few months, there have been a variety of ideas put forward as to ways in which we can measurably increase the number of amateur radio operators in Australia. A lengthy detailed paper on additional entry points, etc to the amateur radio ranks was presented by Jim Linton and Roger Harrison; and Gordon Bracewell presented another less radical concept in August AR. In *Over to You* in August AR, Ted Gabriel presented another concept and from my experience his conclusions are more in line with how things are in the real world. This is not to knock the earnest efforts of Jim, Roger or Gordon as we do need more amateurs if our amateur bands are to be retained.

We are very much in a cleft stick, do we drop our standards and admit anyone who can sign their name or do we stick to reasonably high standards and have not enough amateurs to justify the retention of our amateur bands? It could be asked whether we do need all our bands — who works 10, 18, and 24 MHz for example? Do we need all of 28 MHz, or all of 50 to 54 MHz, maybe 50 to 52 MHz is enough?

The concept of computer buffs being granted a digital type of licence has, on the surface, considerable merit, however, would such a licence be a means to an end? I believe that it would; it is much cheaper over long distances to use radio communications than to use the Telecom system. The aim of the computer buffs is to transfer digital information from point A to point B, the intricacies and interest in the actual radio communications is not where their interest lies. Their interest is in the arena of computers and the software that goes with them. Some would find the radio communications interesting and take up amateur radio in the way that we understand it.

Digital communications is certainly one of the up and coming ways of communicating but I do admit that I like to talk to most operators rather than using CW (a form of digital communications). With the latest forms of digital communications, would the operator know or care if his transmissions caused considerable disruption to other types of communications, in fact if the licence was of low standard technically would he or she even be aware that they were causing interference?

Yes, there probably is a place in the spectrum for digital computer buffs to transmit their messages, perhaps in a band alongside one of the amateur bands. I believe the computer buffs operation is as compatible to amateur radio operation as CB operations are. They are different users of our radio spectrum and, as such, each needs their own specific sector.

How do we get more people into amateur radio? If the Victorian Football League (VFL) cannot get people to go to football matches in sufficient numbers to make it monetarily viable for them, I do not like our chances of doing much better. It must be remembered that there are more and more leisure time activities being dreamed up to fill in our time, and there are only a finite number of people to take part in these activities. After all, about 15 years ago we had one amateur per 2000 of population, we now have one per 1000 of population so we haven't done all that badly.

About the only way that we can expect to get more people into amateur radio is to publicise it more and then guide those who show some interest in knowing more about it. Anyone who is really keen will not find the novice examination unduly difficult. However, many people do experience difficulty in passing the exams because they have faulty learning methods. Many just learn parrot-fashion the correct answer from a group of four in their book of 1002.5 questions with answers. They think that once they know this book off by heart that they know plenty about radio communications — whereas all they know is the answer to all those questions, and probably not the answers to the same questions asked in a different way at the examination. I would suggest that tutors teach and prospective amateurs learn, about radio instead of how to answer questions and they will have considerably more enjoyment out of their hobby because they will be able to understand questions and reason out an answer.

Yes, these books of questions and answers do help but the best thing is to read the questions. Don't look at the answers. Work out the answer, which may mean referring to your text books and then looking at the four answers. You will learn much better that way. This lack of knowledge really hit home when I was talking with a chap in his early 20s who was to sit for the novice licence. I showed him a circuit of a very simple power supply, transformer, diode, capacitor and bleeder resistor and asked him what it was. He replied he did nt know and that he might learn about circuits after he got his ticket? ? ?

Enough said. Let us not drop our standards any lower.

Yours faithfully,

Rodney Champness VK3UG,
31 Helms Court,
Benalla, Vic. 3672.
ar

APPRECIATION

On behalf of the *HMAS Castlemaine Group*, I wish to convey my appreciation and congratulations, on the September issue of *Amateur Radio*.

Considering such short notice, the production team have created, what I consider, to be one of the finest pictorial covers yet. Reproduction from the postcard especially surpassed my hopes and expectations. I have already had feedback from friends interstate, who feel it is worth framing. I myself have sent copies to USA, UK and New Zealand.

Many thanks for the opportunity to publicise the *Castlemaine Award* in this special year for the RAN and the ship. It is, by far, the best "exposure" we have had. I know many an ex-Navy amateur will be thrilled to see evidence, that a part of our Maritime history is "alive and well."

My best wishes to the team.

Kind regards,

Margaret Nally VK3QU,
Castlemaine Group Manager — VK3RAN,
PO Box 144,
Elwood, Vic. 3184.
ar

HELP REQUIRED

Some time ago my wife Johanna DL4AAG and I, decided to try to leave Europe with out two little children.

My first problem is to find a position as a physicist in an Industrialised country, where the people may need someone to work in the radio frequency and microwave area (industrial research, antennas, equipment design, computer-aided measurements). A job including scientific programming (Fortran, Algo1, PL1, Pascal) and/or teaching would also be very welcome.

We thought of Australia, of course, and that among the members of the WIA there may be professionals who can give me the names of companies and institutions that may be interested to receive my resume.

Many thanks in advance.

With best regards,

Klaus Munter DC6XE,
Fuchsweg 17,
D-3300 Braunschweig,
Germany FR.
ar

SELDOM COMES TRUE

I was interested in reading the article in AR of July 1986, *Prophecy from the Past*. Reading it a second time it came to mind that a prophecy seldom comes true in the lifetime of the person who made the prophecy.

It made me think of my article in AR of October 1947, in reporting my QSO with W7ACS/KH6 on 50 MHz on August 26, breaking the then world record, and where I more or less prophesied that WAC could be possible. WAC on 50 MHz did occur many years later and, although I did not obtain that ambition, several of my world-wide friends did procure that distinction.

Your sincerely,

C H Castle VK5KL,
29 Turnbull Road,
Enfield, SA. 5085.
ar

VHF/UHF CONTESTING

I would like to make some observations on VHF/UHF contesting in Australia. Based on a number of years of entering the Ross Hull Contest over the Christmas/New Year break, and various entries in the John Moyle Field Day and Remembrance Day Contest, there is a considerable amount of activity that does not appear as contest entries.

Also, the contest opportunities for limited call licensees are somewhat limited! The Ross Hull Contest is the only 'real' VHF/UHF contest and its aims are more suited to a handful of experimenters rather than to contesters! The two other contests available to VHFers — the RD and JMFD — have traditionally assumed that all contacts will be FM local, and thus score minimum points. There is thus minimal incentive to try any SSB DX — after all, you get the same points as a local FM contact. So, VHF activity just acts as a fill in between bursts of HF activity, or when the poor propagation reduces the scoring rate. There is very little point in trying hard for VHF DX.

In an effort to find out what happened in other parts of the world, particularly the United Kingdom

and United States, I checked through back- issues of *Rad Com* and *QST*. It was at this point that I became aware of 'squares' and the benefits that they brought, not only to contesting, but also to VHF/UHF DX in general. Alas, squares have been slow to catch on in the rest of the world, but that is slowly changing.

My overseas research started to show some interesting facts. UK and USA VHF/UHF enthusiasts have many contests available to them. Scoring is usually based on frequency and occasionally on distance, where distance is determined by locator squares. Some contests are single band only, and to overcome possible difficulties with propagation, are either of 30-40 consecutive hours duration, or spread over two weekends. The RSGB publishes a basic set of general rules for both HF and VHF/UHF/SHF contests, with particular contests selecting appropriate rules from the standard set. There is even a code of practice for contest operation. It is also interesting to note that not only are repeaters banned in ARRL contests, but also the use of repeater frequencies and the national FM calling frequency (146.520 MHz in the USA) are banned!

A new twist to the VHF/UHF contests in America was the introduction of locator squares into the Spring Sprints in April 1983. These are six hour contests, with different dates for each band. Judging by the reports of contest activity in *QST*, this has been an outstanding success. "This grid system is the greatest thing that has happened to VHF since the 'Twoer'" said KA1ECL. In fact, John Lindholm W1XX, of the ARRL Headquarters Staff, has said that the aim of introducing 'squares' was to be a motivation for greater activity on the VHF bands in the USA, since the CW and SSB portions of the bands are currently under-used.

In an article in *QST* entitled "VHF Contesting" John Lindholm discusses the various issues that have affected contests over the years. While this may not be directly relevant to the Australian scene, I believe there is one very valid comment: "The genealogy of VHF contests is that they are patterned after the HF contests." He quotes a number of 'band-aid' solutions to the problems of VHF contesting — contest exchanges and FM — and indicates that nothing less than an all encompassing review will revive the 'patient.' "... attempted solutions to perceived inadequacies of the VHF contest have been addressed by the repeated application of band aids. The patient bleeds profusely from every orifice, and instead of asking, 'Is there a doctor in the house?' we apply salve and send the poor soul back into battle for another run."

An ad hoc committee was formed (under the auspices of the Contest Advisory Committee) to look at the matter, with input called for from all VHF contesters. John finishes with the exhortation '... let's develop a comprehensive VHF contest program that will again enhance VHF operating activities ...". Perhaps it is time we had something like this here?

The recent popularisation of the 'National Parks Award' in Victoria has sparked a number of expeditions to various parks, and has resulted in increased HF and VHF activity. Perhaps the introduction of 'squares' into Australian contests would have the same result? It might also be a way of eliminating some of the problems with the 'State' scoring areas currently used in the HF contests.

Another point that emerges from the overseas magazines is that the format of the contest exchange has been slowly changing. No longer is it the traditional RS/T plus sequence number, but may include geographical/locator information as well. Perhaps this is something that could be thought about for Australia?

There was some discussion on these issues at the last Federal Convention. Perhaps a committee of interested parties could be formed to report on VHF/UHF contests? Hopefully the above thoughts will stimulate some of the other keen VHF/UHF contesters to put pen to paper and perhaps we may conclude with some interesting contests in this part of the spectrum.

73,

Peter Gamble VK3YRP,
8 Bath Road,
Burwood, Vic. 3125.

SYDNEY/MELBOURNE REPEATER LINKING

The second and final meeting of the Sydney/Melbourne repeater linking interest group was held at the beginning of September.

The Trio-Kenwood Amateur Radio Club have permission to use the North Point Building for the Sydney end of the Sydney/Melbourne UHF linked repeater. This location will provide UHF mobile and hand-held stations easy access to the system. All the equipment required for the entire link is due to arrive in December.

instead of forming a new group, the WIA Council has been asked to send correspondence to the existing Trio-Kenwood Club, who already have one approved UHF licence and are willing to assist with locating commercial sites wherever a gap may currently exist in the Sydney to Melbourne route.

This interest group has defined the project as follows and has requested the WIA Council to now undertake its furtherance.

The Sydney/Melbourne UHF Repeater Linked System is designed to foster the development of the 70 cm band by the linking of 70 cm repeaters for free- access amateur radio use. As such, the linking of repeaters on other bands to this system will not be encouraged except in the following special cases.

i To provide an emergency capability to extend the range of a repeater on any band provided this capability cannot be freely activated except by WICEN;
ii Free access by any amateur of any repeater outside the 70 cm band to the UHF Sydney/Melbourne link would require unanimous agreement of all clubs charged with maintaining the Sydney/Melbourne link.

Icom Australia Pty Ltd have offered to provide half the equipment for the national link.

Sam Voron VK2BVS,
2 Griffith Avenue,
Rosevllle, NSW. 2068.

QSP

GOVERNMENT TO PUSH COMMUNICATIONS EXPORTS

A strategy to develop Australia's communications equipment industry into a $600 M export earner by 1996 has been released by the Department of Industry, Technology and Commerce.

The enormous growth potential in communications has prompted special attention to the sector. The strategy follows six months of discussion with Industry associations, combined trade union groups, Telecom, OTC and government officials.

—From *Electronics News*, August 1986

AIMED FOR EXPORT

Codan recently released what it believes is a world first in commercial HF transceivers — a frequency synthesised HF single sideband transceiver.

It features a 99 channel capacity — tunable anywhere from 2 to 18 MHz — with 100 watts output. Teamed with a fully automatic tuning whip antenna, the transceiver should offer increased flexibility to operators of HF networks.

Three years and a "seven figure sum" have gone into developing the transceiver with 50 percent of its R and D funds coming from the government's Industrial Research and Development scheme.

The Codan Type 8525 appears to have the strong export potential the government is hoping will become commonplace among local communications products.

The HF market, although somewhat saturated in Australia, is a growing market in developing countries, particularly Africa, the Middle East and South-East Asia.

Codan intends to satisfy local market needs first, then build up production as is begins a full scale launch of the product into overseas markets.

Australia is already the highest per capita user of HF SSB in the world. Due to a combination of the size of the continent and the lack of telephones in many outback areas. HF networks are the only practical means of communication for many Australians.

The fully automatic tuning whip antenna system further increases the units flexibility. Designed in conjunction with the Hobart-based antenna manufacturer, Moonraker, it features a sliding ferrite driven by a stepper motor.

—Compiled from *Electronics News*, August 1986

OVERSEAS BUSINESS

The Federal Government has given approval for Telecom to compete for general overseas consultancy and project management work.

The approval came by way of an amendment to the memorandum of association which applies to Telecom's wholly-owned subsidiary, Telecom Australia (International) Ltd (TAI).

Early in 1986, the government gave approval for Telecom to establish TAI so it could bid for telecommunications projects in Indonesia.

Telecom's managing director, Mel Ward, is the chairman of TAI and K V Loughnan is its executive director.

The Communications Minister, Michael Duffy, said Telecom's experience in the development of long distance rural telecommunications systems could be of benefit to developing countries.

He said that Telecom and its predecessor, the PMG's Department, had a long history of providing consultancy services and technical assistance to many countries, but these services were provided by way of secondment of officers or under Australian aid programs, in particular the Colombo Plan.

"Telecom's skills are highly regarded by both the World Bank and the Asia Development Bank.

"Export opportunities for the telecommunication manufacturing sector should open up a result of TAI's efforts.

"For example, Telecom and NEC (Australia) had signed an agreement to market and sell Telecom's digital radio concentrator system to China and Pacific countries." he said.

—From *Electronics News*, August 1986

Obituaries

GEORGE MEATON VK4ASQ ex-VK2APM

On August 13, 1986 amateur radio, both local and DX, lost a valued member when George passed away peacefully at his home, aged 70.

George enlisted in the AIF when he was 25-years-of-age, as a Batman, but he quickly sought a course in signals and transferred to the Royal Signal Corps. He served in Greece, Crete, and the Middle East, and later, after specialised training in Kana Code, did a tour in Papua New Guinea with the "Army Special Wireless Group."

He was discharged as medically unfit with a knee injury in late 1944 and joined the Department of Civil Aviation, Communications Branch, during November 1944, serving at Rose Bay (four years); Norfolk Island (six years); Broken Hill (six years); Ceduna (2 years); and from 1968 until October 1977 was at Sydney Flight Service Centre in various supervisory and training positions. The last three and a half years saw him as Regional Flight Service Supervisor.

In his 33 years in aviation he progressed from basic operating tasks to the top position of his field in New South Wales — a great achievement!

George was a helpful, kind, competent person who was highly respected by all, as can be judged by the scores of tributes received by his wife Thelma and son, Robert.

Typical of George's benevolence in general, and to amateur radio in particular, he bequeathed his radio equipment, masts, aerials, etc to the Gold Coast Radio Society for furthering its activities.

Deepest sympathy is extended to George's wife Thelma and son, Robert.

—Ken Irwin VK4TR ex-VK2ELL

GORDON AUGUSTESEN VK4XG ex-VK4JN

"Gus", as he was known to his friends was 71 years old when he passed on at the Gold Coast after suffering poor health for the past few years.

Gus spent his whole working life associated with the electrical and electronics industry, consequently he was well known among the Brisbane electrical and radio wholesalers and retailers, pre and post World War II, when he served as a radar technician with the RAAF.

From *Astor Radio* Gus started his own business, *Tel Air*, specialising in HI-FI, television and amateur radio equipment, from which he retired to the Gold Coast some years ago while still enjoying amateur radio, particularly on 70 cm and with amateur television. The latter equipment was donated to Gold Coast amateurs by his son.

Gus was secretary of the WIA, Queensland Division for some three years post-war and pre-war particularly took part in Field Days and other experimental works.

As VK4JN, Gus broadcast records on 200 metres from Mitchelton.

Gus is survived by his wife Dawn, son Jeff and daughter Linda, to whom the sympathies of his amateur friends is passed.

—Contributed by Peter Brown VK4PJ

Solar Geophysical Summary

JULY

Solar activity was very low in July with no energetic flares being observed. Despite the low activity there were a number of small regions visible on the solar disk in the periods 3rd to 22nd and 27th to 31st. These regions maintained the 10 cm flux in the low 70s for much of the month and produced the relatively higher sunspot number for the month.

The region visible in the period, 27th to 31st was a "reverse polarity" region and so is characteristic of the next solar cycle rather than the present cycle. Such regions start to appear towards the end of each cycle, usually at higher solar latitudes. Old cycle and new cycle regions overlap for several years around the solar minimum period.

Despite the increased monthly sunspot number for July, the yearly averaged sunspot number has started to fall once again. The average value for January was 13.9. This is lower than the values observed since April 1985, which have been close to a value of 17.

The yearly averaged numbers for 1985 were 1/85=20; 2/85=19.1; 3/85=18.0; 4/85=17.8; 5/85=17.8; 6/85=17.5; 7/85=16.9; 8/85=16.6; 9/85=17.1; 10/85=17.4; 11/85=17.0; 12/85=15.4; 1/86=13.9.

The monthly average for 7/86 was 17.8 (6/86=0.8; 5/86=13.1).

The 10 cm readings for the month were: 1=67; 2=66; 3,4=67; 5=69; 6=72; 7=70; 8=69; 9=70; 10=73; 11=72; 12=71; 13-16=72; 17=73; 18=72; 19,20=71; 21=70; 22=71; 23-27=69; 28=70; 29=72; 30,31=71. Average was 70.3.

GEOMAGNETIC

July continued the recent trend of quiet months as are normal close to solar minimum. The most significant disturbed period was the period 24-27 with the A-index reaching a peak value of only 20.

July 2 The geomagnetic field was disturbed in the period 06- 1500 UTC. A=14

July 24-27 The geomagnetic field was disturbed after 1800 UTC on 24th and was at storm levels until 0000 UTC on 25th. The field was disturbed at times on 25-27th. A=16, 19, 20, 18 (17 on 29th).

July 29-30 The geomagnetic field was somewhat disturbed the entire day on 29th and the first half of 30th. A=11.11.

From data supplied by the *Department of Science, IPS Radio and Space Services*, July 1986.

QSP

RADCOM ACT INSPECTORS

The Department of Communications is asking all state police departments to appoint radio licensing inspectors. A DOC spokesman says the Australian Federal Police already have licensing inspector powers under the Radiocommunications Act, but they hope state police will appoint some of their officers as well to help enforce the Radcom Act. This will ultimately result in state police checking to see if radio transmitting equipment, particularly mobile and portable gear, is currently licenced.

DOC is to introduce a system whereby stickers would have to be placed on mobile or portable transceivers to help readily identify licenced equipment.

The Western Australian Police Commissioner has already agreed to appoint inspectors — making that State the first.

DOC estimates that unlicensed equipment costs it up to $6 million a year in lost revenue. It has also made it clear to the state police departments that it will work with them to combat radar jammers. Police in most States fear jammers will be used to interfere with police radar speed traps.

A leading US electronics magazine earlier this year featured a full constructional article on how to make one. The device could be set to give "false targets" to the police radar while the vehicle in which it was installed travelled well above the legal speed limit.

Use of a jammer, which is an illegal transmitter, and causing deliberate interference, are offences under the Radcom Act. The penalty is fines up to $10 000 and/or imprisonment to a maximum of five years.

Meanwhile, some state governments are moving to outlaw radar detectors, used in motor vehicles to give drivers in advance warning of police radar speed traps. These receivers are not covered by the Radcom Act — but state legislation is being considered to make it an offence to sell or possess a radar detector.

They can cost several hundred dollars and were sold by motoring and electronics shops. One retailers says he estimates one top model detector has sales of 10 000 throughout Australia. The unit imported from Japan, cost nearly $500 and had a range of up to five kilometres.

The New South Wales Government planned to introduce legislation soon to outlaw radar detectors and jammers — other states were also taking an interest.

—Submitted by Jim Linton VK3PC

WHAT'S HAPPENING IN THE IONOSPHERE with VK2QL

For Sydney, MUFs were down 10 to 15 percent during the local daytime hours during July. The only disturbed period in Sydney was July 28, when ionospheric critical frequencies were slightly depressed during the day. In the Northern Hemisphere, ionospheric critical frequencies were depressed for the period July 22 to 31. Solar activity was expected to be low in September.

VK2QL has been going back through some records and logs, and those new to chasing DX may find some of the facts interesting.

One hears there is an 11 year cycle during which conditions reach their peak and bottom. This is not the case, for example, Cycle 21 is expected to bottom this year. Cycle 20 bottomed in 1976, Cycle 19 in 1963, and Cycle 18 in 1954, so on that short period we do not have one 11 year cycle.

In the Swiss Observatory bulletin for June 1976, they made the comment that in the first half of 1976, 42 sunspots had appeared, only six of them belonging to the new cycle, which is the current one. VK2QL has a copy of all cycles since 1700. Those who were active in DXing in the late 50s will remember the excellent conditions of Cycle 19, when the peak was over 200. The only cycle which approached that figure occurred in 1778 and that cycle lasted from 1775 to 1784.

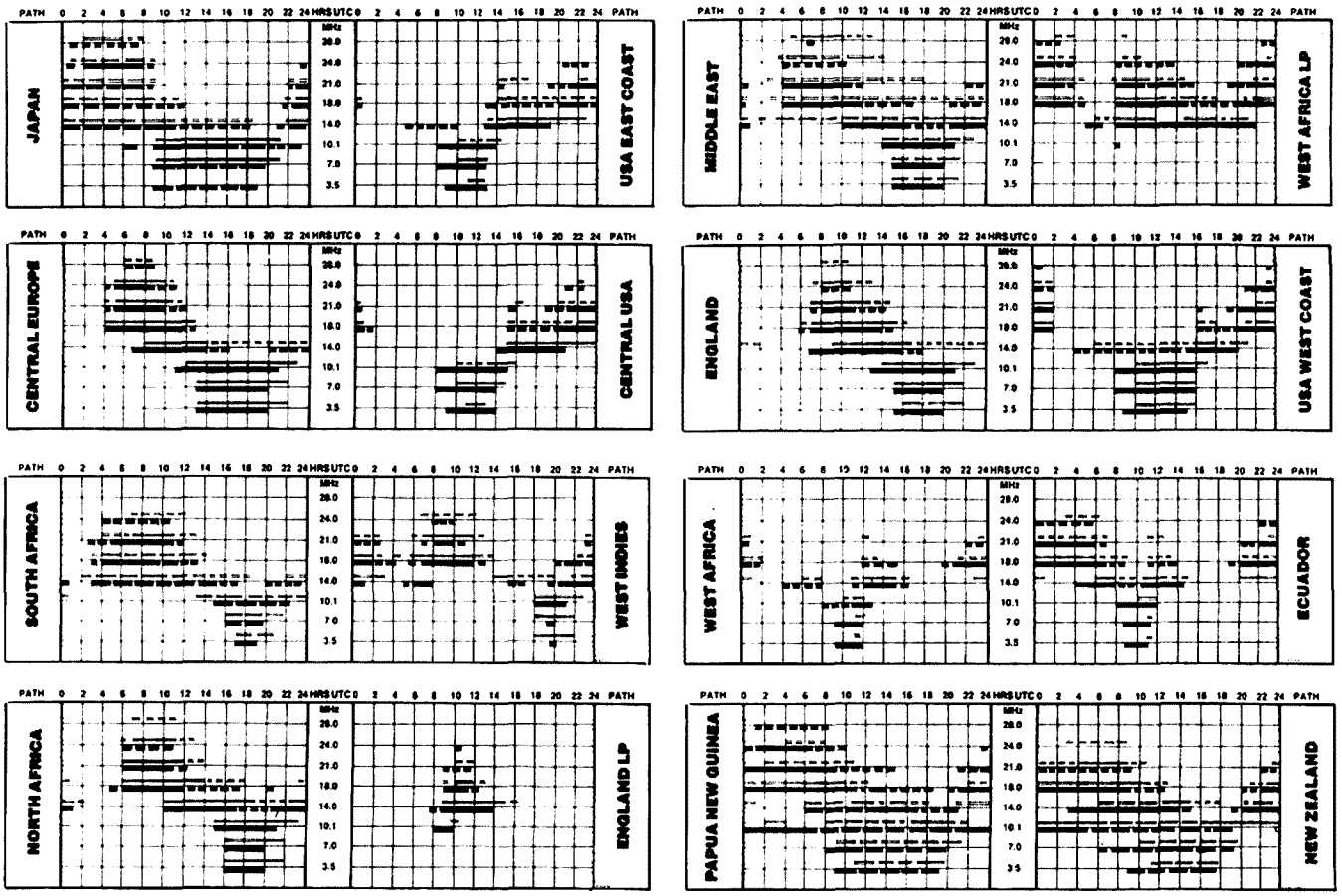
ANNIVERSARY OF THE PCB

This year sees the 50th anniversary of the printed circuit board, which was invented in 1936 by Paul Eisler. Paul had a "tough road to hoe" with his invention in Britain, as he was advised that his invention would replace the production line which was much cheaper. The invention was then utilised in the United States in the manufacture of proximity fuses for shells during WWII.

In the late 1940s the US government decreed that all electronic circuits for airborne equipment be on PCBs.

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND
From Western Australia (Perth)
From Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; ie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Silent Keys

It is with deep regret we record the passing of —

MR BRUCE ATTWATER	VK2AZC
MR GORDON AUGUSTESEN	VK4XG
MR O L BROWN	VK3ARL
MR L A OANCEY	VK4LY
MR BILL DOUGLAS	VK3GA
MR GEORGE MEATON	VK4ASQ
MR R J NANKIVELL	VK5AJN

STOLEN EQUIPMENT

It is very pleasing to report that a Yaesu FT-708R UHF transceiver, stolen from BJ Kennedy VK2XJD, has been recovered.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a seperate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non- members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

DEADLINE

All copy for inclusion in the January 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, 10th November 1986.

Minimum charge — $22.50 pre-payable
Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105x 220mm SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

ZZV ANTENNA FARM: Get with the action on ATV. We have antennas designed by Hi-Q Antennas for Channel 34. These antennas are available in both 10 and 18 elements. For further information and for all your antenna needs, contact ZZV Antenna Farm. VK2ZZV, QTHR. Ph:(049) 54 8688.

WANTED — NSW

BEAM: 3 *element* tribander. VK2TG, 17 Nelson Street, Engadine, NSW. 2237. Ph:(02) 520 4337.

BLUE COVERED WILLIAM ORR RADIO HANDBOOK: Prop Pitch Motor. Valve Bases for 813. Tcvr — TS-820S. Maurie VK2DCD, Box 72, Coleambally, NSW. 2707.

CIRCUIT DIAGRAMS: for Johnson Viking 352-D CB & Cobra- 138XLR-A CB. Both 40 ch SSB units. Will pay coats. Bob VK2VMX, QTHR. Ph:(063) 51 4217.

COMMUNICATIONS RECEIVER: Yaesu FRG-7700. VK2QC, QTHR. Ph:(044) 76 7927.

POWER SUPPLY: 13.8 VDC, 20 A Kenwood PS-30 for use with Kenwood tx TS-120S. VK2EJU. Ph:(065) 53 1385.

WANTED — VIC

ANY "RARE" RECORDINGS: ot amateur radio contacts for Volume 2 of "The Sounds of Amateur Radio." We are particularly interested in recordings of contacts on Bands not now available to Australian amateurs, eg 112, 288 MHz, etc. We are also looking for recordings of unusual contacts, eg from Balloons, Aircraft, Submarines, etc. Any recording format can be handled from cylinders to CD. In the first instance please write to: Peter Wolfenden VK3KAU, c/- Federal Office, PO Box 300, Caulfield South, Vic. 3162. Please do not send recordings. Copies of Volume 1 "The Sounds of Amateur Radio" are still available for $7, plus post & packaging. Inquire at your Divisional Bookshop or the Federal Office.

COPY OF CIRCUIT DIAGRAM & SERVICE MANUAL: for Trio 9R-59D. Will pay all costs. Must be air mail to New Caledonia. Phillip Hardstaff, Maintenance Technician, SPC, BP D5, Noumea Cedex, New Caledonia.

HISTORICAL INFORMATION: Any leads on M A K Ryan or his relatives. He was the Founding President of the Amateur Wireless Society of Victoria (now WIA) 1911-12. Contact Jim Linton VK3PC, QTHR.

VALVES: 6AH6, 6GK6, 8KD6, VR105MT. Will accept reverse charge calls. VK3CNF, QTHR. Ph:(03) 723 1159.

YAESU FT-221 VHF 2m TRANSCEIVER: Also 6148 valves. Melbourne area. John VK3ABW, QTHR. Ph:(03) 568 7428.

YAESU or KENWOOD SEPARATE SPEAKER: to match Yaesu FT-101ZD or similar. Kenwood SP-100 15 cm wide x 11 cm deep with 9 cm speaker would be ideal. Roth Jones. (03) 870 3333 BH.

WANTED — OLD

TRANSVERTER: FTV-707, FTV-700, with 6m, 2m or 70 cm for FT-707. Must be in good condition. Also modem suitable for *TRS 80 Colour Computer.* Steve VK4KHQ QTHR. Ph:(077) 43 4508.

KENWOOD STATION MONITOR: SM-220. VK4ATQ, QTHR. Ph:(07) 374 1008

WANTED — SA

FC-107 ATU: (cream face unit if possible). FP-107 PSU module. Also DMS memory unit. All suit FT-107 t/rx. Ray VK5AVH, QTHR. Ph:(087) 62 2034.

FREQUENCY COUNTER: YC-601. Any information on the Yaesu YC- 501 frequency counter or if for sale please QSL to D A (Den) Sharp L50109, 142 East Terrace, Henley Beach, SA. 5022. Ph:(08) 356 8304. All replies answered promptly.

WANTED — TASMANIA

TO BORROW: to photocopy, circuits, data, Palec SG1, Advance type 63, Marconi TF801B, sig generators. Heathkit alignment generator, Leader LAG 55, Yaesu YC-500S, Data Precision Digital Multimeter Mod 134, Heathkit Capacitance Meter, Impedance Bridge, Q-meter, 5" scope 10-12U. Philips Pulse Gen, Taylor 948 pattern generator, Sailord instrument valve voltmeter RF, Mod BW-211B. VK7LR, QTHR. Ph:(004) 24 2525.

FOR SALE — ACT

NEC CQ-110E HF TRANSCEIVER: 160-10m, 7 years old. Good appearance. 135W PEP output. Recently overhauled — everything but heart transplant. See ETI mag, July 1977 for test results. Solid build, wt 18 kg. $300 plus freight. Jock VK1LF, QTHR. Ph:(062) 88 1910.

FOR SALE — NSW

ANTENNAS: 440 MHz Yagi silver soldered brass construction, 12 elements. $55. 1296 MHz Yagi 18 elements, silver soldered brass construction. $55. Precision reflectometer, head good to 3 GHz. $70. 1296 MHz & 2304 MHz front end tuned circuits. All brass silver soldered construction. $50 each. VK2ZHS, QTHR. Ph:(02) 59 5390.

CRYSTALS: 80 metre, frequency 3.530 MHz ±50ppm, temp range -10 to +60 degrees C. Stability 50 ppm. 32 pF load capacitance. $18 per crystal. Dennys. Ph:(02) 477 7689.

FDK MULTI 2000A 2m TRANSCEIVER: synthesised FM, SSB, CW. $395 firm. VK2ASU, OTHR. Ph:(02) 639 7962.

FU400 HEAVY DUTY ANTENNA ROTOR: complete with control panel, power supply & 2 sets mast clamps. 40' telescopic mast with fittings. 3 el 10m Yagi. $280 the lot. VK2NAJ, QTHR. Ph:(02) 50 4055.

HEATHKIT HW-9 QRP CW TRANSCEIVER: $180. Ross VK2EJE. Ph:(066) 49 7631.

HY-GAIN 18AVT/WB: multiband vertical. Excellent condition. $85. Also, KW Electronics traps for 80-10m dipole. $60. Larry VK2EOY. Ph:(02) 949 3124.

ICOM IC-27A 2m TRANSCEIVER: very little use, original packing & manual etc. Very small unit, memory & scan etc. 25W RF output, with excellent receiver. $485 ONO. VK2SW, QTHR. Ph:(069) 21 2125 BH or (069) 22 6082 AH.

KENWOOD $20: with MIC $500 ONO. Ph:(02) 759 1274.

KENWOOD TS-520S: HF, 2 mice; MC-10 & MC-60. 5 band trap vertical, plus manuals. $800, will separate. Also 10A peak power supply. $50. Dave VK2JDF. Ph:(043) 67 6629 AH.

MAP 64/2: CW, RTTY, AMTOR, cartridge for C64, complete hardware & software. As new $360. VK2KGU. Ph:(043) 92 1611.

PDP 11/03 COMPUTER: 2 x RK05 disc drives. VT52 screen. Operating system & RTTY software. $1000. Ph:(042) 96 4595.

SALE BY TENDER: FRG-7700 Receiver. See VK2 Mini Bulletin.

YAESU FC-707 ANTENNA TUNER: as new with manuals. $200 ONO. Robert VK2EGR. Ph:(02) 674 3272 AH or (02) 669 7730 BH.

YAESU FT-680R: 6m all mode, good condition. $400. Yaesu FT- 480R 2m *all* mode, very good condition. $500. Icon IC-4E 70cm FM hand-held, very good condition. $300. All with manuals, etc. Colin VK2COL. Ph:(068) 42 2305.

FOR SALE — VIC

ATARI 400 COMPUTER: 16k, 3 games cartridges, basic cartridge, 2 joysticks, 1010 program recorder, reference & operator's manuals & book on Atari Basic. $250 the lot. Harold VK3ZRM, QTHR. Ph:(051) 69 1679.

FIBREGLASS DISHES: Reject Ku band dishes. Suitable for 10 GHz & lower. 1.5 to 3.3m. Peter Waterhouse VK3CWR Ph:(03) 874 1783.

FT-290 2m ALL MODE TRANSCEIVER: with Mutek preamp & 30W linear mobile mounting bracket & carry case. 5 element beam & Ringo antennas. Swap for communications receiver or CB gear. Freddo VK3KTC. Ph:(03) 489 2187.

HALLICRAFTERS SX-100 MK2 HF RECEIVER: VGC. Cica 1960 - AM/SSB. Freq range .538 to 34 MHz in 4 bands. No gaps. Ptua operating & service manual. $200 or swap for IC-R70/FRG7700. John L30479. Ph:(058) 21 0846.

HELRAY PEAK POWER METER: 200W. $40. SWR bridges. Heath 1kW. Kyoritsu. $30 ea. Autek switched audio noise filter. $35. Heath VTVM. $30. 2m converter (VK3AFQ). $45. RTTY modems MDK 17. $90. ETI 755. $100. Tubes 2C39A. New $20. Dick VK3AHT, QTHR. Ph:(03) 874 4967.

ICOM 25H: in original box. $375. Yaesu YO-100 monitorscope, excellent condition. $75. Shure 444 microphone. $30. ONO. Oscar block $35. VK3TG QTHR. Ph:(056) 52 1636.

ICOM 751 HF TRANSCEIVER: with base mic, mobile mic. As new. $1850. Icom AT-500 fully automatic Ant Tuner. $1150. Icom IC-3200A dual band transceiver, inc mic & mobile bracket. Brand new $850. Commodore 84 computer, disc drive, MPS 802 printer, datasette, 18" colour TV, 60 discs full of software & more available. Ex cond. $1360 the lot. Patrick Bond VK3VRK, 15 Wood Street, Roeedale, Vic. 3847. Ph:(051) 99 2393.

PEARCE SIMPSON SHUTTLECOCK MX-215: 2 off headset tranaceivera on 55.035 MHz. Brand new, only used 1 hour. Range about 400 metres. Sell aa a pair for $135. Rodney VK3UG, QTHR. Ph:(067) 62 1454 AH or (057) 62 3288 BH.

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YAESU 101ZD: as new cond. Used only as S/B unit. Full WS manual, spares including finals. $650. Microphone new, Astatic with preamp. $80. VK3XV, QTHR. Ph:(03) 527 4029 after 5 pm.

YAESU FT-290R: all mode 2m transceiver, including mobile bracket. All as new. $430. Alinco 60W 2m amplifier with rx preamp. Suits FT- 290R or similar. $200. Stuart VK3CST Ph: 720 3188.

FOR SALE — QLD

HELIAX ½" 50 ohm: 1 length 44m, other 37m. Tender price for one or both. Crating charge. VK4BRB, QTHR.

KENWOOD TW-4000A: 2m/70cm dual band tcvr. 25W FM. Covers 144-148, 430-440 MHz. 10 memories, scan, priority, optional voice synthesiser, hi/low pwr, etc. Mint cond. With mic, cradle, manual. Forced to sell, bargain. $590. VK4BZB. Ph:(07) 345 8731 AH.

MICRONTA 8A 12 VDC POWER SUPPLY: $50 plus freight. Dick Smith Hornet 40 ch mobile converted to cover 26.245-28.685 MHz in good condition. $150. Yaesu FL-110 linear amp, excellent condition. $250. Would consider swap for FTV-700/FTV-707 transverter or modem to suit TRS80 colour computer. Steve VK4KHQ, QTHR. Ph:(077) 43 4508.

SHACK CLEARANCE: Icom IC-202 2m SSB transceiver. $100. DC6HL *homebrew 25W linear amplifier* to suit IC-202. $60. Icom IC-502 6m SSB transceiver. $80. Homebrew 20W linear amplifier to suit IC-502. $50. Marconi TF995A/3/5 signal generator (0.2 to 220 MHz) needs repair. $110. R A Ratcliffe Model 600 deviation monitor (70 to 510 MHz). $55. R A Ratcliffe model 202 AM/FM signal generator (50 to 220 MHz) needs repair. $55. Mullard 5ABBI cathode ray tube. $10. Greg VK4ZDC, QTHR. Ph:(076) 34 4276 AH.

FOR SALE — SA

ICOM IC-730 HF TRANSCEIVER: in good condition. Also one unused mobile mounting bracket. $600 ONO. VK5APN, QTHR. Ph:(08) 293 3866.

FOR SALE — WA

ATLAS 350-XL TRANSCEIVER: 160-10m, 350W PEP, USB, LSB, CW. DD6-XL digital read-out dial & 305 auxiliary VFO. Both factory installed. Accessories. 350PS AC power supply, DMK-XL mobile mount. MT-1 balun match. Kenwood SP-40 mobile speaker. MC-35S noise reducing mic. All cables, plugs & service manual. All in mint condition. Transceive facilities cover 1.5 to 23 MHz & 28 to 30 MHz, plus 10 auxiliary crystal channels. Total package. $850. VK6RU, QTHR. Ph:(09) 385 9664.

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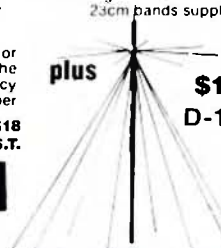

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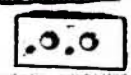

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electronic imports

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A LOOK AT LC OSCILLATORS

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Amateur Radio

VOL. 54, No. 12 DECEMBER 1986

Photograph courtesy Peter Koen

Jenny VK5ANW, President of the VK5 Division, presents Marion Centenary Award Certificate No 1 to Mrs June Appleby MP, during the Centenary of the District of Marion. Due to space limitations in this issue, a full feature spread of the event will appear in January.

Amateur Radio

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Special Features

Technical Features

Regular Features

Now is the time to start "dropping hints" for those last minute Christmas Presents. To aid your selection, many advertisers have taken multiple pages to show what is available.

As is usual in the December issue, the Annual Index is featured on page 22. This index covers the feature articles which have appeared during the year.

Ian VK5QX, the Federal Contest Manager, has compiled the results of the 1986 Remembrance Day Contest (see page 36). Congratulation to the Queensland Division, this year's overall winner.

Also in the Contest Column is the rules for the Commonwealth Contest, conducted by the RSGB over the weekend March 14-15. As this is the 50th year of the contest being conducted there will be special awards presented.

Seasons Greetings to all readers.

DEADLINE

All copy for inclusion in the February 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, January 2, 1987.

Now there are more reasons to subscribe!

With Australian Electronics Monthly now incorporating Elektor Electronics — there are more reasons to subscribe.

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With Elektor inside AEM, now you get more scope and variety in articles, features and do-it-yourself projects. This means — you should not miss a single issue! To avoid disappointment, make sure you get every issue — SUBSCRIBE!

It's cheaper to subscribe! Rather than pay $57.00 for an annual subscription ($4.75 a month), you can subscribe at $49.95!

And what's more, you could win yourself a great Weller soldering station!
Fill out the coupon and send it today.

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Subscribe, and you could win this superb Weller WTCPN Soldering Station courtesy of Cooper Tools. Each month, we'll award this prize — worth over $140! — to the new subscriber who best answers the questions here.

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Editor's Comment

AN AUSTRALIAN AMATEUR HANDBOOK?

Many of you will by now have obtained your copy of the 1986-87 Call Book. Some of you will be disappointed at its reduced size this year, although regrettably the price is still the same as last year. As has been announced on the Divisional broadcasts, this is caused by the continually rising cost of printing and production, largely due to the diminishing value of the Australian dollar. We have cut costs this time by eliminating much of the technical material which last year comprised half the book.

Some of this material is still useful, but some of it becomes obsolete as time progresses and conditions and techniques change. Rather than repeat each year the more enduring material, we have been discussing for months how to meet your needs without this expensive duplication. Closely related to this is how best we can satisfy the obvious need for an Australian technical handbook as mentioned last month. Perhaps we can combine these related needs and provide a solution at lower cost to all of us than trying to tackle each problem separately.

There would seem to be three possibilities:

a A thin Call Book (like the present issue) containing as well as the annually updated call signs a minimum of other material;
b A thicker volume (like last year) containing about 50 percent call signs and 50 percent other data, much of it unchanged over two or three years;
c An even thicker production which also provides some handbook-type technical material in the form of theory and construction articles.

Obviously these three alternatives are in increasing order of cost. Option 'c' will cost considerably more than 'a'. How much? We can't cost it until we know the market. From your viewpoint it may well be worth it. To go a stage further, rather than expect you to have to hunt through several years' call books to find a particular item, could we perhaps provide the data on detachable pages arranged for filing in a binder? Updates and additions would accompany each year's Call Book, including an updated index. The VK Amateur Handbook would become a living volume, growing larger each year!

As is so often the case, we can only do for you what you tell us you want. So this issue of Amateur Radio is accompanied by a small questionnaire for you to tell us what you think of the Call Book plus Handbook idea. Fill it in and send it back with your subscription renewal. We promise that your reply will be separately processed from your renewal and not associated with your name and call sign unless you want it that way. You want complete anonymity? Send it back in another envelope, if you think it's worth 36 cents!

Another year now has only a few weeks to go. I hope you have all found 1986 better than it might have been. May we (the Publications Committee, the Executive, Betken and I) wish you all a very Merry Christmas and a happy and prosperous New Year.

Bill Rice VK3ABP
Editor
ar

Main QSP

AMATEUR RADIO — the technological pursuit of radio communications by individuals

Radio communications, as a field of technology, has made tremendous advances since the first radio signals were transmitted, which was in very recent times when we consider the history of mankind.

We, as amateurs, have been actively involved in these advances. Amateur radio gives the opportunity for an individual to participate in the many aspects of radio communications — an opportunity that must never be denied.

Although the mysticism of the early achievements of radio amateurs has long since passed and the amateur is no longer considered the local wizard!

There can still be a sense of achievement and self-esteem, in mastering a new technique, proving a theory or finding an alternative simpler way to do things.

With the diverse nature of radio communications there are now many different aspects that attract individuals to amateur radio.

It is also important that the opportunity is always available for anyone to progress as an amateur from the simplest basic aspects of radio communications through to the most sophisticated, finding their own desired level of involvement as they go.

Amateur radio, while realising the technical nature of the pursuits, must not be elitist, entry must be accessible, but on the converse, the pursuit of esoteric techniques must not be inhibited.

To this end, the current trend of self-regulation is to be welcomed.

Of course, some regulation, albeit self-regulation, is necessary to allow for the harmonious co-existence of the many different enthusiasms of the radio amateur.

In conclusion, if the amateur service, which is the pursuit of the techniques of radio communications purely out of self-interest, is to maintain viability, it has to keep moving with the time to make it attractive to the newcomer to attain his or her own goal.

I now take this opportunity of wishing you a Happy Christmas and a Prosperous New Year.

David Wardlaw VK3ADW
Federal President
ar

KENWOOD
SUMMER SALE
STILL AT MARCH '86 PRICES!

TH-205A
ILLUSTRATED

SENSATIONAL OFFER!

2 METRE 5 WATT HAND HELD

Only $275

FEATURES	TH-205A	TH-215A
POWER OUT	5 WATT	5 WATT
FREQUENCY	144 MHz-148 MHz	144 MHz-148MHz
MEMORY CHANNELS	3	10
KEYBOARD ENTRY	NO	YES
UP/DOWN SCAN	YES	YES
FREQUENCY LOCK	YES	YES
EXT. SPEAKER/MIC.	YES (OPTION)	YES (OPTION)
12 VOLT CIGAR PLUG	YES (OPTION)	YES (OPTION)
WEIGHT	350 gms	350 gms
SIZE	70W X 180H X 40D	70W X 180H X 40D
SUPPLIED ACCESSORIES	AA BATTERY PACK AERIAL	AA BATTERY PACK AERIAL
	$275	**$350**
OPTIONS (See your dealer for prices)	NICAD PACK CHARGER	NICAD PACK CHARGER

STILL AT MARCH '86 PRICES

KENWOOD SUMMER SALE!

TS-440S
HF TRANSCEIVER
$1585

The TS-440S is an HF transceiver designed for SSB, CW, AM, FM and AFSK modes of operation on all Amateur bands including the new WARC bands. It is the ultimate in compact size with the automatic antenna tuner built-in and featuring a highly efficient final amplifier cooling system. It incorporates a 100 KHz to 30 MHz general coverage receiver having superior dynamic range. Advanced digital technology controls the various functions, including dual digital VFOs, 100 memory channels, keyboard frequency selection, memory and programmable band scan, and RIT plus XIT. Additional operating features include full break-in CW (switchable to semi break-in), built-in automatic antenna tuner, IF shift, notch filter, IF filter selection, RF attenuator, speech processor, and other features for ease of operation and added versatility.

TS-940S
HF TRANSCEIVER
$2950

The TS-940S is a competition class HF transceiver having every conceivable feature, and is designed for SSB, CW, AM, FM and FSK modes of operation on all 160 through 10 meter Amateur bands, including the new WARC bands. It incorporates an outstanding 150 KHz to 30 MHz general coverage receiver having a superior dynamic range (102 dB typical on 20 meters, 50 kHz spacing, 500 Hz CW bandwidth).

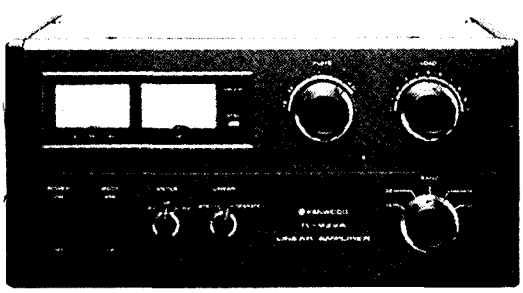
Engineered with the serious DX'er/contest operator in mind, the TS-940S features a wide range of innovative interference rejection circuits, including SSB IF slope tuning, CW VBT (Variable bandwidth tuning), IF notch filter, AF tune circuit, Narrow/Wide filter selection, CW variable pitch control, dual-mode noise blanker, and RIT plus XIT.

TL-922
HF LINEAR AMPLIFIER

The TL-922 is a band linear amplifier designed to provide maximum legal performance, utilising two 3-500Z high performance transmitting tubes. Incorporates class AB_2 round-grid amplifier circuit. Excellent IMD (intermodulation distortion characteristics).

$1600

VALVES NOT INCLUDED



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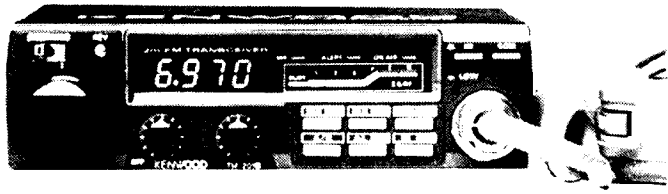
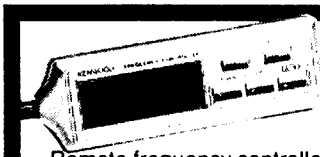
TM-201B
2M FM MOBILE TRANSCEIVER



The KENWOOD TM-201B 2-m FM mobile transceiver is designed to be the ultimate in compact size and lightweight, allowing maximum flexibility in automotive installations. New microprocessor controlled operating features, improved receive and transmit circuitry, a powerful 50 watts of RF output.

Ga As Fet RF Amp.

2 METRES AT A BUDGET $495



FC-10 $20 ONLY

Remote frequency controller only $20 each when sold with each TM-201B during period between Nov. '86 and Jan. '87.

TM-2550A
TM-2570A
2M FM MOBILE TRANSCEIVERS

50 WATTS $650

70 WATTS $695

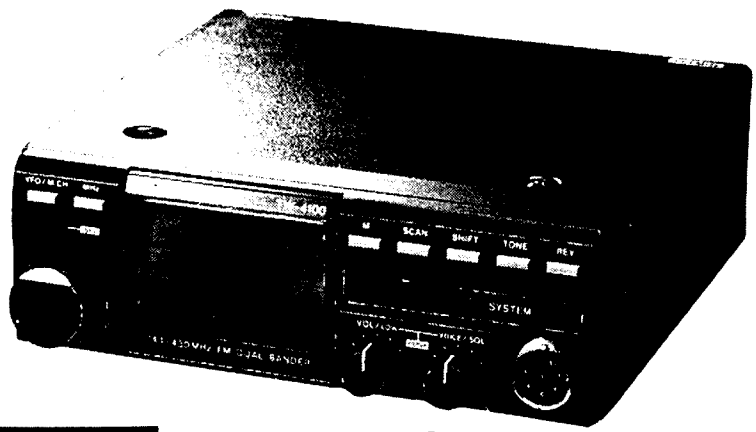
Ga As Fet RF Amp.

The KENWOOD TM-2550A/TM-2570A 2 meter FM Mobile transceivers have been designed to satisfy the needs of the most demanding 2m mobile operator. A wide range of innovative features have been incorporated in the basic design, including a large, new, easy-to-read LCD display, 23 multi-function memory channels for storing frequency, offset, telephone number and auto-offset.

Compare the TM-2570A with other brands and you will find our 70 watts is the same price as competitors 50 watt models – i.e. 20 watts more for the same price.

TW-4100A
UHF/VHF FM DUAL BAND MOBILE TRANSCEIVER

144-148 Mhz – 420-450* Mhz
2M 50 Watts – 70cm 25 Watts
FULL DUPLEX BETWEEN BANDS
10 MEMORIES
*Adjustable.



NEW MODEL

THE INTRODUCTION OF THE TW-4100A HAS BEEN DELAYED UNTIL FURTHER NOTICE. CONTACT YOUR DEALER FOR DETAILS:

ORDER NOW! $875

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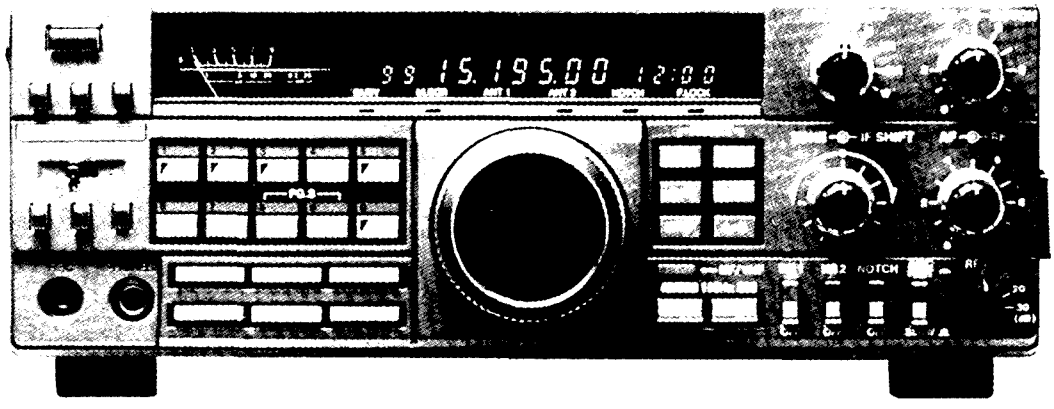
KENWOOD SUMMER SALE!

R-5000 COMMUNICATIONS RECEIVER

The R-5000 is a new competition grade communications receiver which incorporates every conceivable operating feature. Designed for all modes of reception (SSB, CW, AM, FM, FSK), the R-5000 covers the frequency range from 100 kHz to 30 MHz, and with the addition of the optional VC-20 VHF converter, will also cover the 108 to 174 MHz range, again with all mode reception. The R-5000 has been designed with high performance in mind, and has an excellent dynamic range, together with carefully chosen operating facilities to match today's conditions. Microprocessor control is used for main functions, including dual digital VFO's, 100 memory channels, memory scrolling, memory and programmable band scan, and many other facilities.



CAPTURE THE WORLD ONLY $1075

FEATURES

Coverage is 100 kHz to 30 MHz in 30 bands, with an additional range from 108 to 173 MHz using the optional VC-20 VHF converter.

Advanced microprocessor control allows frequency, band and mode data to be stored, recalled, and displayed, even in the VHF band of the VC-20.

The RF circuits of the R-5000 have been designed to give a high dynamic range, and with the 500 Hz bandwidth selected (YK-88C option), the intermodulation free dynamic range is 102 dB, with a third order intercept point of + 14 dBm, and a noise floor of – 138 dBm.

High stability frequency control.

The reference oscillator which determines the frequency stability and readout accuracy of the R-5000 is accurate to + or – 10 ppm within a temperature range of – 10 to + 50 degrees Celsius.

10 Hz step dual digital VFOs.

Built in dual VFOs operate independently of each other, and allow split frequency and split mode operation. The frequency steps are basically 10 Hz, giving that "True VFO" feel when tuning. The frequency steps are changed to 1 KHz in AM mode, and 5 kHz in FM mode.

Provision is made for the connection of both high and low impedance antenna systems.

Superb Interference Reduction.

Selectivity is enhanced by the use of dual crystal IF filters for SSB, and further features include IF shift and tunable notch filters. The IF filter selection system is fully flexible, in the same manner as the TS-440S transceiver, and offers automatic selection by mode, or manual selection according to the operator's requirements.

A dual *mode noise* blanker system deals effectively with both impulse noise as well as the "woodpecker".

Keyboard Frequency Selection

Frequencies can be entered using direct keyboard control, and a frequency lock switch prevents accidental frequency changes from occurring.

100 Memory Channels Capability

100 memories are provided, which store frequency, mode, and which antenna has been selected. Memory information can be scrolled to review contents of any memory channel.

Memory Scan and Programmable Band Scan.

Further memory facilities include memory scanning with programmable memory lockout, and programmable band scanning with centre stop for accurate on-channel tuning.

Plus a full list of other desirable features:

• Dual 24 hour clocks with timer • Optional VS-1 voice synthesiser for frequency announcement • Optional control by personal computer using the IF-232C interface • Lithium battery backup of memory contents • Built in AC power supply and option to use the receiver on 13.8 volt DC supplies • High quality internal loudspeaker • AGC time constant switchable fast/slow • Switchable RF input attenuator (0 to 30 dB in 10 dB steps).

To summarise: the R-5000 from KENWOOD offers the operator a top performance communications receiver of the very highest quality, with all the features and functions which the discriminating user could demand.

With the R-5000, KENWOOD gives the dedicated listener a receiver which will match the performance of the very best transceivers available today.

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STILL AT MARCH '86 PRICES

TS-711A 2M
TS-811A 70 CM
ALL MODE TRANSCEIVERS

The TS-711A 2-m and the TS-811A 70-cm all-mode transceivers feature enhanced ease of operation through the use of new microprocessor technology that permits the incorporation of the widest range of innovative features in a very compact package. These features include KENWOOD's new, exclusive DCS (Digital Code Squelch), 10-Hz step dual digital VFO's, a new, multi-function fluorescent tube digital display, 40 multi-function memory channels, programmable band scan, memory scan, mode scan, auto mode function, "quick-step" main tuning dial, IF shift, speech processor, all-mode squelch, noise blanker and an easy-to-operate front panel design.

TS-711A $1290

TS-811A $1335

TS-670 ALL MODE "QUAD-BANDER" TRANSCEIVER

FITTED WITH GC-10 GENERAL COVERAGE RECEIVER

XMAS SPECIAL $880 VERY LIMITED STOCKS

The TS-670 "Quad-Bander" is a unique all-mode transceiver that covers the 6 meter VHF band, and the 10,15 and 40 meter HF bands, combining the ultimate in compact size with advanced circuit design and performance. This outstanding radio may be purchased with an optional general coverage receiver that tunes continuously from 500-KHz to 30-MHz. Key features include dual digital VFO's, 80 memory channels, memory scan, programmable band scan, frequency direct key selection, a two-colour fluorescent tube display with function indicator LED's, IF shift and squelch.

TR-751A
2M ALL-MODE TRANSCEIVER

The TR-751A all-mode, 2-m transceiver delivers superior performance and "All Mode Mobility". Packed with all of the most often needed features including auto-mode selection, dual digital VFOs, 10 memories plus "COM" channel, programmable CTCSS tone, various scan functions, all-mode squelch, noise blanker, RIT, DCL (Digital Channel Link) and easy-to-operate front panel layout. And, designed with the latest state-of-the-art technology, this compact rig is the one to choose for VHF stations on-the-go.

NOW ONLY

$750

STILL AT MARCH '86 PRICES

KENWOOD SUMMER SALE!

DIGITAL CODE SQUELCH

TRIO-KENWOOD's new DCS "Digital Code Squelch" is a revolutionary signalling concept for Amateur Radio that utilises current state-of-the-art technology. This new technology is a major feature of all Kenwood new generation equipment. The DCS should not be confused with conventional CTCSS (Continuous Tone Coded Squelch System). DCS uses a 5 digit, digitally coded data string, to open squelch on a receiver that has been programmed to accept this same specific code group. By utilising a 5 digit code group the operator may choose from 100,000 possible combinations, thus providing increased security. In addition to the 5 digit "access code" the DCS also transmits the operators call sign, in decimal ASCII code. Call signs of a maximum of 6 digits may be entered. By using the optional CD-10 Call Sign Display, the operator may store incoming call signs, for later review or logging.

ALL KENWOOD NEW GENERATION EQUIPMENT FEATURES DCS CAPABILITY:

PLUS TM-211A
TM-411A
TM-2550A
TM-2570A
TW-4100A
TS-711A
TS-811A
TR-2600A

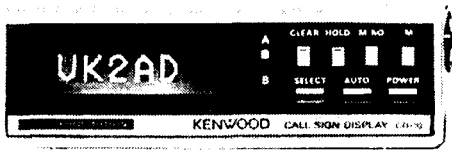
100,000 different 5 digit code groups.
Convenient keyboard entry of the "access code" is possible with all models equipped with the DCS.

Capable of monitoring multiple access codes.
The DCS codes, and call sign data, are stored in separate memory locations within the host unit. This allows the operator to monitor several access code groups at one time. Clubs and nets will find this function useful, as will operators who wish to listen for more than one group at a time.

CD-10
The CD-10 store the call sign of calling station in its memory and displays it on an LCD display. Call signs of up to 20 of the most recently calling stations are stored, allowing the operator to quickly check for and return any call.
DCS Decoding. Decodes the digital ASCII call sign data that is a portion of the DCS data string.

Automatic Call Sign Transmission.
A 6 digit Amateur "Call Sign" is entered into the DCS memory using decimal ASCII coding, by use of the front panel keyboard. This call sign is then transmitted in conjunction with the DCS data string each time the PTT. switch is despresed or released. By using the optional CD-10 Call Sign Display the operator can automatically store up to 20 different call signs. This feature is useful for unattended monitoring of the radio. Upon return to the station the operator can review the CD-10 memory to determine who tried to contact him during his absence. This function is also useful for logging purposes.

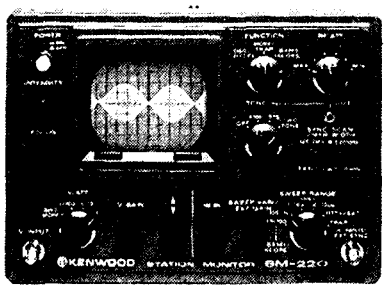
CD-10



CALL SIGN DISPLAY SYSTEM $160

INCLUDES FREE AC ADAPTOR

PC-1A PHONE PATCH CONTROLLER $96

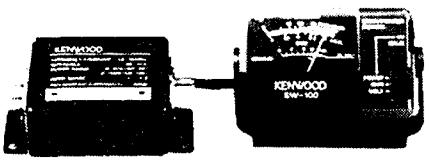


SM-220 STATION MONITOR VALUE AT $555

The SM-220 station monitor features a built-in two-tone generator for, a wide variety of waveform-observing capabilities.
An optional feature is a unique panoramic display capability. The SM-220 provides efficient station operation as it monitors transmitted waveforms, and it also serves as a high-sensitivity, wide-frequency-range oscilloscope for various adjustments and experiments.

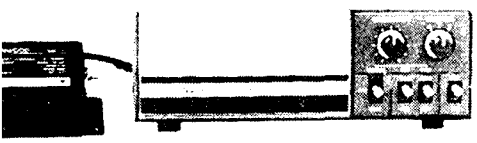
KENWOOD SUMMER SALE!

STILL AT MARCH '86 PRICES



SW-100 A/B $75

SWR/POWER METER
Compact and lightweight SWR/POWER/VOLT meters cover 1.8 – 150 MHz (SW-100A), 140 – 450 MHz (SW-100B) in range of 150W full scale for mobile use.



SW-200 A/B $150
SW-2000 $160

SWR/POWER METER (Supplied With A Coupler).
SW-200A supplied with SWC-1, SW-200B supplied with SWC-2, SW-2000 supplied with SWC-3. Selectable peak-reading/RMS, SWR/POWER meters cover 1.8 – 150 MHz (SW-200A), 140 – 450 MHz (SW-200B), 1.8 – 54 MHz (SW-2000) in range of 0 – 20/200W (SW-200A/B), 0 – 200/2000W (SW-2000) full scale to base station use.

AT-130 $180

ANTENNA TUNER
The AT-130 is a compact and lightweight antenna tuner designed for base or mobile use. It consists of an antenna coupler, an SWR meter and an antenna switch.

MC-60A $120

MC-60A (8 Pin)
Deluxe Desk-Top Microphone With Built-In Pre-Amplifier.

MC-80 $70

MC-80 (8 Pin)
Desk-Top UP/DOWN Microphone With Built-In Pre-Amplifier.

MC-85 $140

MC-85 (8 Pin)
Multi-Function Desk-Top UP/DOWN Microphone With Built-In Audio Level Compensation.

RF DUMMY LOAD (20W continuous)
• Impedance: 50Ω • Frequency range and V.S.W.R.: DC~500 MHz, 1.1:1 • Input power' 20W (continuous) 50W (intermittent – 1 minute ON, 3 minutes OFF) • Maximum temperature: 200°C (329°F) • Cooling: Natural air flow • Connector: M type connector.

RD-20 $32

LIGHTNING & STATIC PROTECTOR
AL-1: Handles 100W output at 50Ω with SQ-239 Connector.
AL-2: Handles 1 kW output at 50Ω with SQ-239 Connector.

AL-1 $40

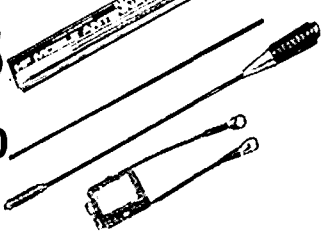
LOW-PASS FILTER
• Cutoff frequency: 30 MHz • Attenuation: More than 90 dB between 90 and 300 MHz • Durability against input power: 1 kW PEP • Insertion loss: Less than 0.5 dB at 30 MHz • input/output impedance: 50Ω.

LF-30A $53

MA-5
80-m/40-m/20-m/15-m/10-m.
Five Band Helical-type HF Mobile Antenna.
The MA-5 is a multi-purpose HF antenna for mobile operation.

MA-5 $205

MA-4000 (50Ω)
2-m/70-cm Dual Band Mobile Antenna with Duplexer.
The dual bander's ability of the TW-4000A can be brought into full operation by combining the MA-4000.



MA-4000 $65

All merchandise on this and the preceding 6 pages is available from all the Kenwood Electronics Distributors listed below.

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

YOUR DEALER BELOW WILL GUARANTEE SATISFACTION

Further beware of dealers not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Electronics Australia Pty. Ltd. and have no guarantee applicable.

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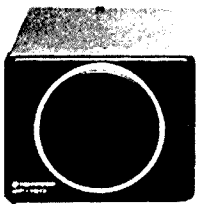

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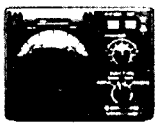

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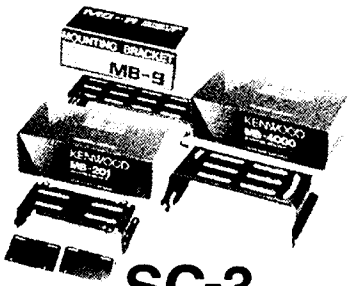

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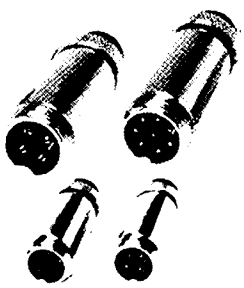

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MORE ABOUT A MULTIBAND END-FED INVERTED-VEE AERIAL SYSTEM

Written by Colin Dickman ZS6U

Reprinted from RADIO ZS, January 1978 and contributed to AR by James Crichton VK2XFC

The aim of this article is to provide a summary of the article published last month and to expand on some of the details therein.

By using a wire two wavelengths long at 10 metres, a very simple band-switched L-network matching unit can be used to preselect 10, 15, 20, 40 and 80 metres, quickly and reliably.

The system is preadjusted to provide a purely resistive load to the transmitter. Unlike other multiband systems there is no reactance present to cause loading difficulties accompanied by RF in the shack, BCI and like problems.

There are no transmission line losses, consequently all of the RF from the transmitter is radiated by the antenna.

By using lobe alignment, the antenna yields useful directivity and gain over a dipole or vertical, especially at the higher frequencies.

On reception, the antenna has a greater capture area at the higher frequencies than a dipole or vertical. In addition, the L-network provides a degree of selectivity. The two together result in a stronger, cleaner signal.

The two-wavelength version requires less than 14 metres of ground space.

The length of the wire is obtained from the formula:

$$L \text{ metres} = \frac{984\,(N - 0.0125)}{f\,(MHz)} \times 0.3048$$

N = Number of wavelengths at the highest frequency.

For example, for two-wavelengths at 28.6 MHz, L = 20.84 metres. This is the overall length of the wire right up to the antenna terminal of the L- network.

The circuit diagrams for L-networks for two and four wavelength antennas together with coil taps and dimensions are shown in Figures 4 and 5. The preadjustment procedure is to insert a SWR bridge in the coax between the rig and the L-network, switch it to the reflected power position and, using sufficient carrier on 40, 20, 15 and 10 metres in turn, adjust the capacitor C for the lowest dip in the meter reading. With the two-wavelengths system there is no tuning on 80 metres and capacitor C is merely set to minimum capacity. With the four-wavelength system, the adjustment procedure for 80 is the same as for the other bands. Mark each band setting of capacitor C on its dial so that band changing merely involves switching the bandswitch and turning C to the calibrated mark for that band before loading up the rig.

COIL DIAM mm	COIL LENGTH mm	WIRE DIAM mm
35	38	0.95
38	47	1.17
41.3	56	1.4
44.5	66	1.65
47.6	77	1.9
50.8	88	2.2

Table Figure 4.

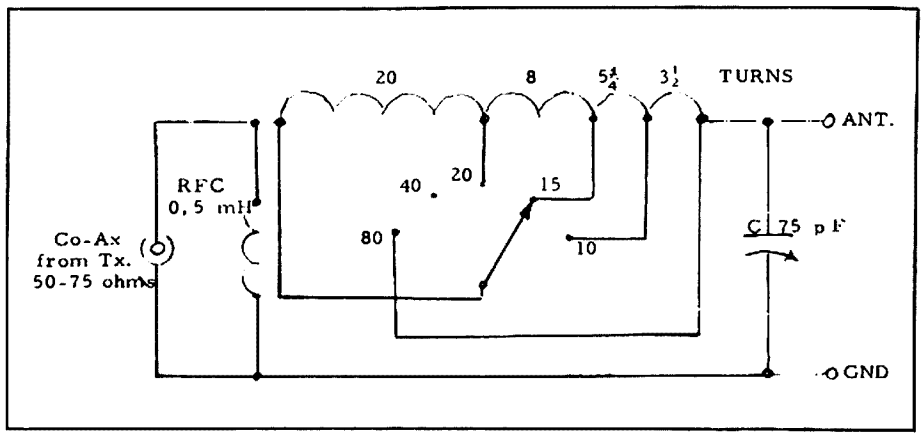


Figure 4.

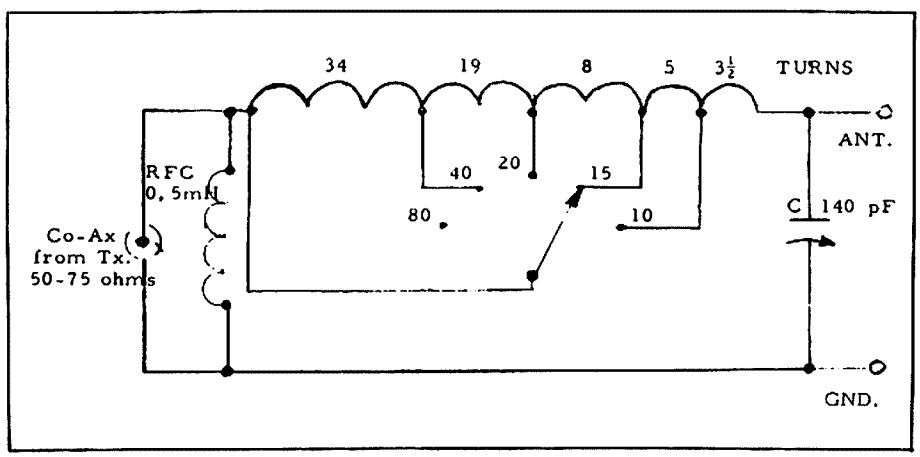


Figure 5.

For greater detail, readers are referred to the previous article.

MORE ABOUT WIRE CONFIGURATIONS

Having stretched and cut your measured piece of wire, you will be looking for some way to string it up. The simplest way may be to use an L- shape or you may need to take the wire in various directions to get it in the clear. Although all the power you put into this antenna will be radiated irrespective of the wire shape, random shapes will not do full justice to the fine performance potential of the antenna. There are certain preferred configurations which will put the signal where it will do the most good. Be assured that the extra effort will be well worthwhile.

The principle of lobe alignment has been used in the three recommended configurations shown in geometric form in Figures 1, 2, and 3 to achieve useful gain at low wave angles. Using the formula and example above, two wavelengths = 20.84 metres and four wavelengths = 41.82 metres.

COIL DIAM mm	COIL LENGTH mm	WIRE DIAM mm
35	64.8	0.95
38	77.9	1.16
41.3	93.3	1.37
44.5	109.5	1.60
47.6	126.1	1.85
50.8	144.4	2.1

Table Figure 5.

Figure 1 depicts the standard ZS6U Mini-shack Special, which is two-wavelengths long on 10 metres and a quarter-wavelength on 80 metres. In this configuration, the change in direction of the wire at the apex splits the antenna into two one-wavelength sections. Starting with the 50 degree lobe angle of a one-wavelength antenna in free space, the wire tilt, apex angle and height can be derived. The two pairs of horizontal lobes tend to reinforce to produce low angle, bi-directional radiation along the

plane of the wire. As with all end-fed antennas, the lobe amplitude in the free end direction exceeds the reverse lobe due to progressive radiation loss along the wire. The gain due to the two-wavelength wire which is about 1.5 dB, is added to the gain from lobe reinforcement, which is about 3 dB to provide a total gain of about 4.5 dB in a wide beam at a vertical angle of less than 10 degrees in the direction of the open end of the wire. The theoretical patterns are shown in the accompanying vertical and horizontal — plane diagrams for 10 metres. On the lower frequency bands, the lobes become progressively mis-aligned resulting in higher angles of radiation with less directivity and gain.

Figure 2 is the full size ZS6U Special which is four-wavelengths long on 10 metres and a half-wavelength on 80. Here the tilt angle is 35 degrees resulting in a triangle having a height of 12 metres. If the dimension, which represents the height at which the wire is connected to the L-network, is taken to be 1.5 metres, then the pole height would be 12 + 1.5 = 13.5 metres compared with 9.5 metres for Figure 1.

Due to the larger dimensions, the gain of this configuration is about 6 dB on 10 metres with a somewhat narrower beamwidth than Figure 1. As long as the full height is used the performance on the five bands is marginally better than the mini-version by about 1.5 dB on each band. If the best possible performance is desired on 80 metres, this is the version to use. It requires the L-network shown in Figure 5.

The lobe alignment principle for low wave angles is also employed in Figure 3, which is half of the inverted-Vee of Figure 2, having the same tilt angle and height, but using only two-wavelengths of wire. As the polar diagrams indicate this version is less desirable than Figures 1 and 2, but is preferable to a straight wire or a random shape. Apartment dwellers please note that this version may be used sloping downwards at the angle shown with good results. You will need to be on the fourth floor or higher.

METAL OBSTRUCTIONS

The near side of the wire is at high impedance on all bands and should therefore be insulated and kept as far as possible from metal obstructions such as metal window frames, gutters, cables, etc. For example, it is not a good idea to close a metal-framed window, etc with the wire clamped between the metal parts. Ideally, the near side of the wire should be secured to an anchor insulator and then should enter through an air brick or wooden-framed window. If a metal-framed window is the only entry point, a small hole should be drilled in the centre of the glass pane (or plastic sheet replacing the glass).

The support for the apex of the antenna should preferably be a wooden pole guyed with nylon rope or metal wire, broken up by egg insulators. In certain cases, where there are two suitable high points on either side of the antenna plane, they can be joined horizontally by nylon rope and the antenna wire thrown over the rope to form the apex.

If s metal pole is used, it is best to shift it two or three metres to one side so that it does not lie precisely in the vertical plane of the antenna. The resulting slight tilt in the plane will have little effect on the performance.

MORE ABOUT ORIENTATION

All three configurations described show decided gain in the direction of the free end of the wire and should therefore be erected pointing in the desired direction. If space allows, two antennas may be erected at right angles and switched alternately to the L-network antenna terminal by means of a porcelain insulated knife switch. Little is to be gained by joining two such antennas together as the power in

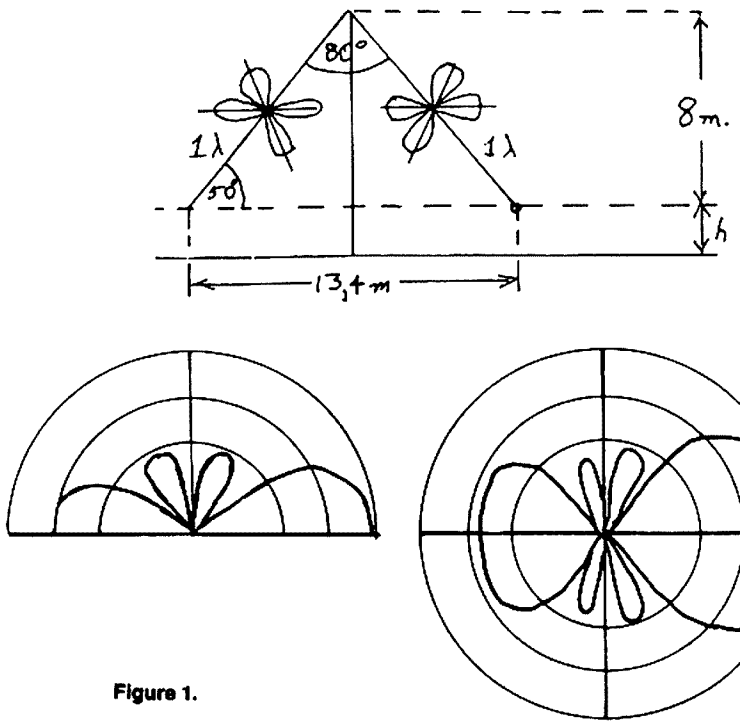


Figure 1.

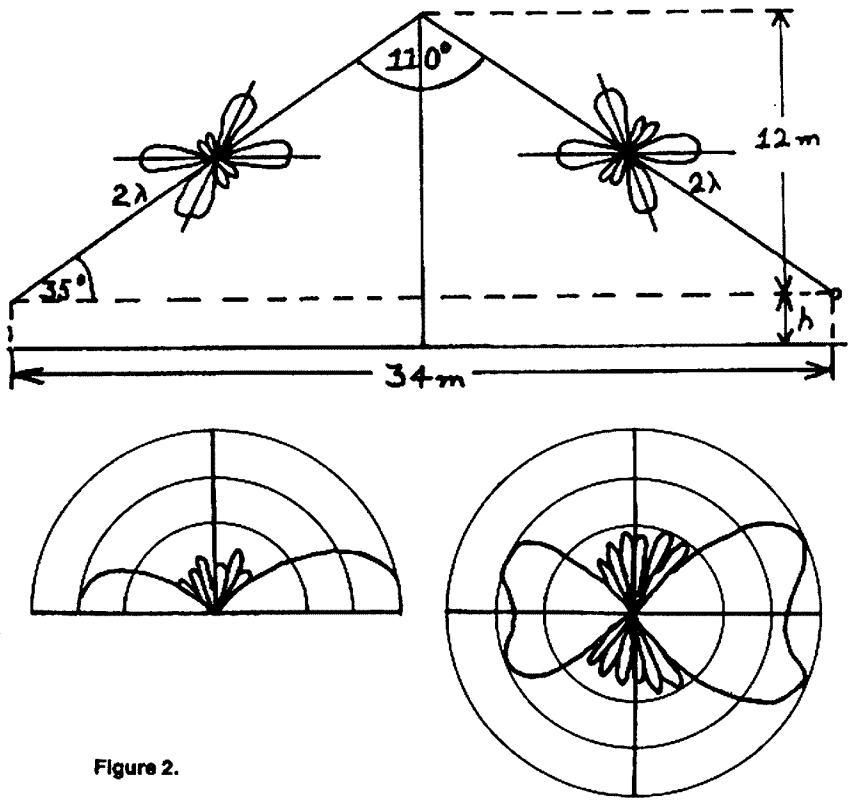


Figure 2.

THE ZS6U MINISHACK SPECIAL — ILLUSTRATION FIGURES 3, 4 and 5

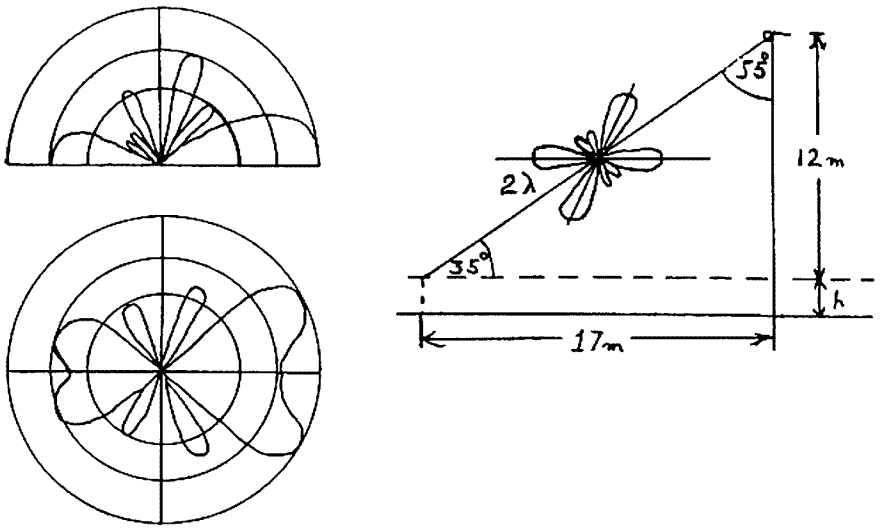


Figure 3.

each would be halved. The impedance at the feed point would also be halved, upsetting the matching of the L-network.

MORE ABOUT THE L-NETWORK

Figure 4 shows the network for two-wavelength antennas of the sort shown in Figures 1 and 3. Figure 5 is the network that must be used with the antenna of Figure 2. The network of Figure 5 can also be used with lengths of 8, 12, 16, 20, etc wavelengths for the adventurous experimenter. The lengths above are given for 10 metres as this is the highest frequency we have been considering, but there is no reason why, using the information given in the original article a system should not be adapted for six or two metre inverted-Vee antennas.

One of the problems facing builders of the original L-network was that I used a piece of 35 mm OD polyethylene tubing for the former and based my coil data on that. Well there is a way for you to use the same number of turns and the same taps with a different diameter former. I derived the following formula, where l_1 and d_1 represent the given length of winding and diameter of coil, and l_2 and d_2 represent the new length and diameter:

$$L_2 = L_1 \frac{d2^2}{d2} + \tfrac{1}{2}(d_2 - d_1)$$

The formula is accurate over a 1.5:1 range. I have worked out a set of values for three and one for both networks, which are presented together with Figures 4 and 5. For example, if you use a coil diameter of 38 mm for the network of Figure 4, you must spread the 20 turns evenly to occupy a winding length of 47 mm. The maximum wire diameter given (in this case, 1.17 mm) is derived from a spacing between the turns equal to the wire diameter. Use the nearest smaller standard size. An air wound coil has the lowest tosses, but if you use a former make sure it has a reasonably lower power factor at 30 MHz. The switch is of the ordinary single-pole, five- position, wafer variety and the condenser should have a spacing of at least 0.5 mm between the plates, otherwise arcing may occur. Enclose the unit in a plastic box. If a metal box is used, the coil should clear the metal by at least 25 mm on all sides.

I must emphasise that the L-network must be looked upon as the equivalent of a quarter-wave transmission line and that resonance on each band (and therefore pure resistive load) is indicated by a dip in reflected power reading. These dips should be found once and the condenser scale calibrated for future operating. If you insist on leaving your SWR bridge permanently in the coax, then there are a few words of advice. As amateurs are inveterate experimenters it will not take long to discover that if you fiddle with the L-network condenser while tuning up (contrary to instructions) you may find the setting to one side of the correctly marked setting which gives a higher reading on the "forward power" scale of the SWR bridge. You are about to fall into the trap of believing that you have discovered a way to radiate more power. But alas, in reality the higher reading is due to undesired reactive voltage being added to the desired resistive voltage. The moral is: interpret SWR meter forward readings with caution.

MORE ABOUT THE TWO-WAVELENGTH ANTENNA ON 80 METRES

Some constructors have had difficulty loading on 80 metres. On this band the antenna is a quarter wave long and an earth is essential for its operation. As with any quarter wave antenna, every metre of earth lead adds to the overall length of the antenna system.

If your earth system is so unsuitable that the antenna will not take power on 80 metres, there are three ways of handling the problem.

a If the earth lead is about five metres long, or less, use a variable condenser of about 300 pF with about 0.5 mm plate spacing in series with your antenna wire to cancel out the inductive reactance thereby electrically shortening the antenna. Set the condenser for minimum reflected reading in the SWR bridge. This condenser should be shorted out during operation on the other bands.

b Use can be made of the property of a half-wavelength of wire to repeat at its near end the conditions that exist at its far end. Choose an earth point sufficiently far away to accommodate about 39 metres of earth lead, the far end of which is then soldered to the earth point. Use insulated wire because the centre of the halfwave will be at RF potential above ground. By varying the length of this lead, the antenna can be brought into exact resonance.

c Use can be made of the property of a quarter wavelength of wire to act as an inverting transformer. Take a piece of insulated wire about 19 metres long, connect one end to the earth terminal of the L-network and leave the far end free. The excess wire can be stapled around the skirting of the shack or hung out of the window or trailed along the ground, but must not be grounded. As in (b), above its length can be trimmed to provide exact resonance. It should be noted that with this method an additional electrical earth must be provided to the rig for lightning and mains protection. If the protective earth connection upsets the antenna resonance, connecting an RF choke in series with it consisting of a close wound single layer of PVC insulated wire on a 10 or 15 mm ferrite rod to isolate it from the RF earth. In any case, it is good practice to use such a choke, especially when the mains earth is used to reduce RF interference with your neighbours.

Here's wishing you an outstanding signal!

—er

QSP

GOLDEN ANTENNA AWARD

With a view to encouraging the world-wide production of high quality films and audio-visual programs in the field of telecommunications and electronics, the ITU is organising *Golden Antenna 87*, the Fifth international Festival of Telecommunications and Electronics Films, within the framework of *Telecom 87*, the Fifth World Telecommunications Exhibition, which will take place in Geneva from October 20-27, 1987.

The Fourth Film Festival, which took place in 1983, was a remarkable success with a record number of entries: 80 films and tape-slide presentations from 20 countries and three international or regional organisations. Australia took part in *Golden Antenna 83* and that production, which was seen by a large audience including international specialists, aroused particular interest. It was a good example of how the basic aim of the festival was achieved.

As in 1983, it is intended to screen the films chosen for the Festival throughout *Telecom 87* so that as many visitors as possible can see them and evaluate the progress made in the vast field of telecommunications, and its impact on socioeconomic development in today's world.

The Festival hopes that Australia will participate in the 1987 Film Festival, which has become an important feature of *Telecom 87*, a fact which is confirmed by the number of acceptances already received.

—Contributed by A G El-Zanati, Film Festival Director

The Wireless Institute of Australia would once again like to participate in this prestigious event.

Any members with experience in film making, and who would be willing to assist the Institute in preparing an entry, should contact their Federal Councillor, or the General Manager of the WIA at: PO Box 300, Caulfield South, Vic. 3162.

An OBLIQUE VIEW OF LC OSCILLATORS

Don Law VK2AIL
RMB 626, Adelong Road, Tumblong, NSW. 2729

Watt for watt, those ancient cycles would travel as far as modern transmitters now send them.

It has always struck me as being a bit off the mark to discuss the operation of LC oscillators in terms of 'when the base (or grid) goes this way the collector (or anode) does this or that and tickles, couples, pushes or pulls or whatever and maintains oscillation.' Invariably each type of oscillator requires a different explanation. All perfectly valid of course; but isn't it rather like putting the cart before the horse? After all, LC circuits were oscillating quite happily long before the days of valves and transistors. As man has always travelled, moved from A to B, so LC circuits have always been capable of oscillation; like bells do ring. Where man can accomplish his transposition in diverse ways, ie by plane, rail, road or being fired out of a cannon; travel being the thing; tuned circuits may be blasted, shocked or fired into oscillation. A means to an end. The early spark transmitters are a classic example. One great big spark and a dozen or so exponentially diminishing RF cycles of oscillation occurred. Here the parallel with the cannon-propelled man ends. Watt for watt those ancient cycles would travel as far as modern transmitters now send them. By rapidly repeating the spark in an attempt to sustain oscillation, information (Morse) could be transmitted to a remote receiver that also had no active components. Unless one could argue that a coherer fell into this category.

The point I make is that oscillatory current in an LC circuit, or a precise frequency determined by

$$f = \frac{1}{2\pi\sqrt{LC}}$$

is the thing. How sustained oscillation is accomplished seems secondary. This view is supported by the inordinate number of devices and circuits designed to do it. There is no one way. Only the LC circuit itself retains its originality and does what it has always done. Why doesn't it oscillate continuously? Well, why doesn't a bell ring forever when hit with a hammer? Because of metal stress and heat losses, air resistance and support damping losses. It takes energy to do things; once that energy is dissipated there is no more.

The losses in an LC circuit are coil resistance (including skin effect at high frequencies), capacitor dielectric resistance (leakage) and dielectric absorption. (Ever had a belt off a television picture tube hours after it had been discharged?).

Tuned circuit losses, the cause of oscillations being 'damped' as energy passes back and forth between coil and capacitor, may be lumped into a single equivalent resistance value. To press home my point, that active devices are secondary in oscillator circuit explanation, is the fact that by introducing an equal amount of negative resistance into the circuit, the cause of 'damping' is removed and sustained oscillation takes place. Series- wise, R = zero. It no longer exists. The tetrode valve may be used to provide the negative resistance. Due to secondary emission, the anode characteristic has a negative resistance region. As the anode potential is increased the anode current decreases, (over a portion of the curve). See Figure 1.

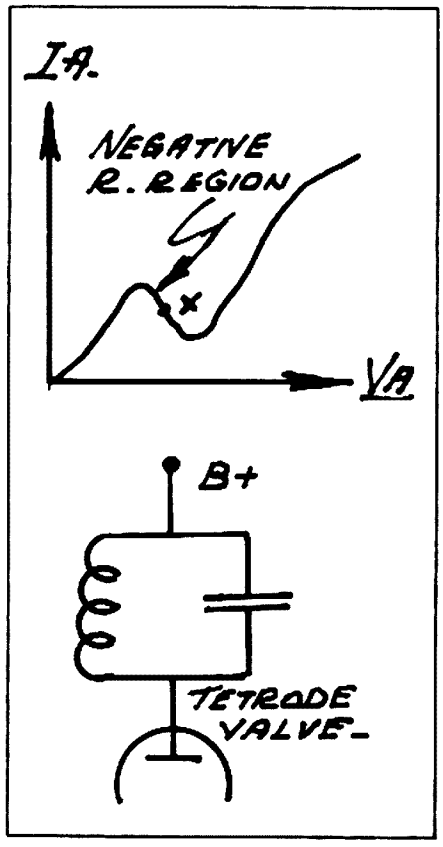


Figure 1.

If a parallel tuned circuit is placed in the anode circuit, and the anode voltage adjusted to point X (on the curve), oscillation will occur. Ah! you may exclaim, but you have used an active device! Alright! Then I will use a diode. A tunnel diode, that is surely passive. See Figure 2.

At 0.58 volts my circuit oscillates continuously. Get the point? All that is necessary is a means of adding or introducing into the LC circuit sufficient negative resistance to cancel the resistance of the tuned circuit. What about power oscillators you may ask? Oscillators used to drive power amplifiers.

Surely power must be provided by the active device. Sure it is, in the right form and at the correct timing but it originates from the power supply; as it does in the tunnel diode oscillator. And, because taking power from an oscillator results in increased equivalent series resistance in the LC circuit, reduced Q factor, more negative resistance is required and is provided by a harder working active device.

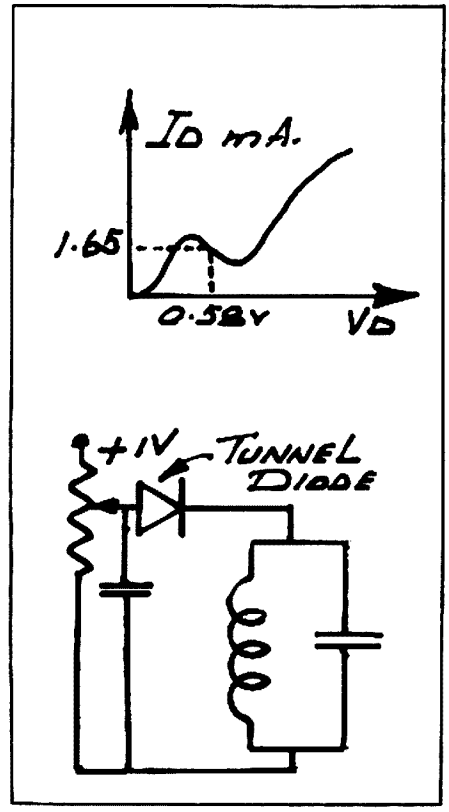


Figure 2.

So whatever type of LC oscillator you come across, think first 'Tuned Circuit, Resistive Losses,' then 'source of negative resistance and how introduced.'

I did mention that this was an oblique approach, but it is worth a few moments thought.

ar

SPECIAL CONDITION

As many amateurs are aware, the Department of Communications (DOC), at present, allocates frequencies within the 576-585 MHz band for amateur television repeater transmitters. However, this is done on the basis that amateurs may employ the band until such time as it is required for use by the broadcasting service, around late 1987.

To give amateurs ample warning, all new and reissued amateur television repeater licenses in the band 576-585 will include special condition 54, which states:

> Future assignments for this frequency band are currently under review and licensees may be required to change frequency or to cease transmission completely, when this review is done.

Signed: J Higginbottom
Manager Licensing
Operations Branch
Department of Communications

ar

A SQUARE WAVE GENERATOR
Part Two

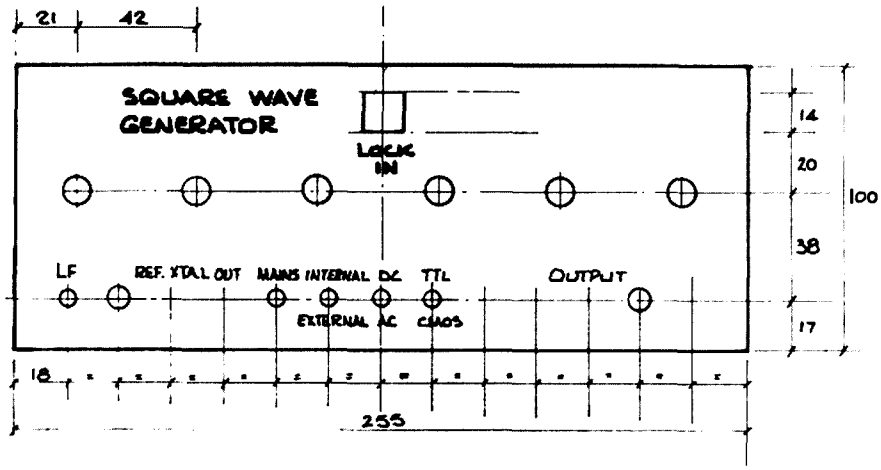


Figure 8 — Front Panel Layout.

Ken Kimberley VK2PY
21 Nicoll Street, Lakemba, NSW. 2195

Last month, Part One of this article described the theory of operation and design of a phase-locked, variable frequency square wave generator. Part Two looks at the construction and testing of the unit.

Firstly, to the metal bashing.

The unit was squeezed into a *Norwood* case, type number B4/10/V, purchased from Dick Smith Electronics, Catalogue Number H2455.

Actually, there was sufficient space inside the case, but the front panel is a little on the small side for my liking.

A scrap pf aluminium sheet, sized 160 x 150 x 1 mm was obtained. This was then fitted, by means of angle brackets, 30 mm up from the bottom of the case. Mount it flush with the rear wall, leaving a clear gap behind the front panel to give access to the switches and their associated wiring — thus forming what we OTs used to call a chassis.

Next came the front panel layout, details of which are shown in Figure 8. The sizes shown suit the components used by the author and may require alteration to suit those used by the individual.

After making all of the holes, check your handiwork by temporarily mounting the switches, etc. Satisfy yourself that everything fits as intended and nothing has been missed. If all is well, remove and store these parts.

The next stage is painting the front panel. Proceed as follows.

Firstly, remove the sheen by rubbing the aluminium with some steel wool and a little elbow grease. This provides a surface to which the paint will adhere more readily.

Now, using a paint pressure pack, spray on the primer, followed by two coats of your favourite coloured enamel. Be sure to follow the paint manufacturer's directions carefully, especially in regard to time between coats.

Label as desired and a coat of clear lacquer will complete the embellishment. Engraved dial knobs (Cat No H3770) were used for the decade frequency selector switches, thus considerably reducing the artwork required.

Modular Construction was used for the electronics. Four individual boards were used, five if the crystal oscillator is counted. Boards One and Two are on the top-side of the chassis and run parallel with the front. They are mounted to the extreme left and front so as to leave enough room for the power supply and oven. Three and Four are placed on the bottom, immediately below One and Two.

In the interests of brevity, power supply and board mounting, etc will not be detailed. The following items are on the rear panel:

Mains Input Grommet
Fuse
12 and 15 volt Regulators
SO239 Coaxial Socket for the External Drive Input.

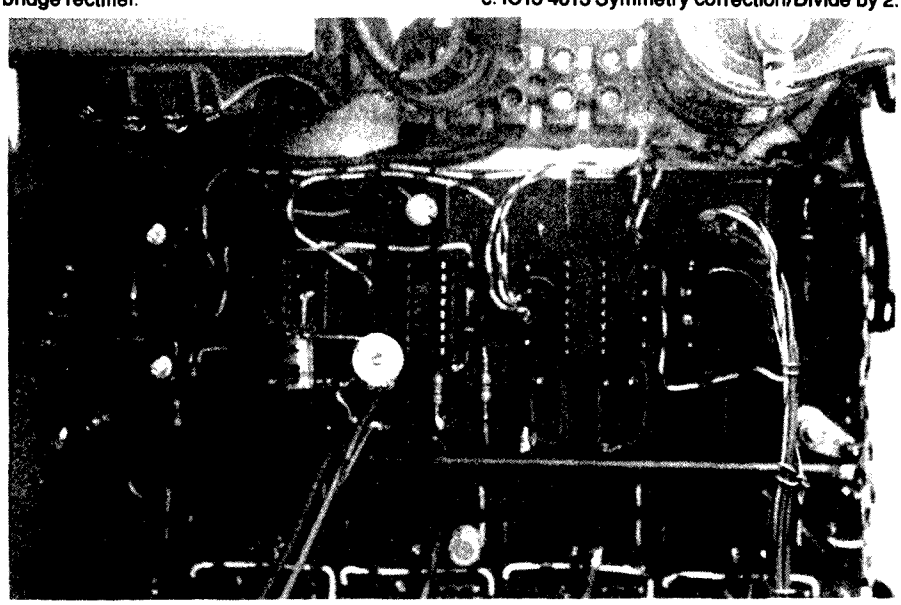
The top side of the chassis carries boards One and Two, power transformer, mains terminal block, 3000 uF electrolytic capacitor and, of course, the reference oscillator. The underside has boards Three, Four and the bridge rectifier.

Having drilled holes for the above, mount and wire the power supply components. Carry out "the smoke test" and if all is well 12 and 15 volts will appear at the output lugs of the two regulators.

ELECTRONICS

The main electronics are built onto four hard wired DIL boards (Cat H5602). The contents are itemised below and are enumerated from left to right:

NUMBER ONE. The VCO — Figures 4 and 9.
a. TR2 (BC108 or similar) "Lock Indicator" drive.
b. TR1 (BC108 or similar) TTL to 12 volt CMOS converter.
c. IC13 4013 Symmetry correction/Divide by 2.



The Wired PLL Board.

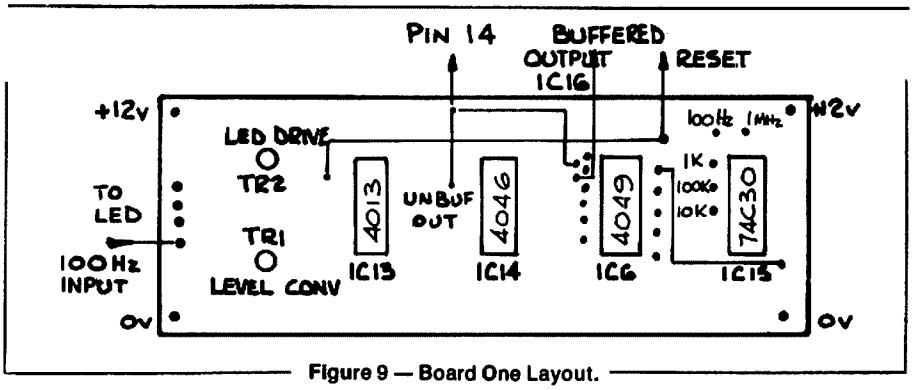
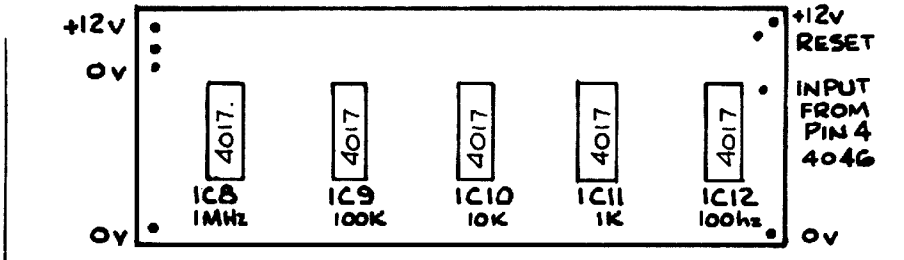


Figure 9 — Board One Layout.



Layout of Board Two.

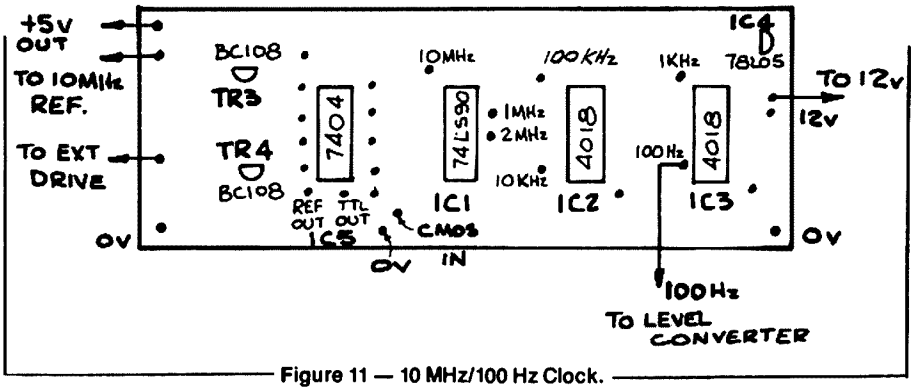


Figure 11 — 10 MHz/100 Hz Clock.

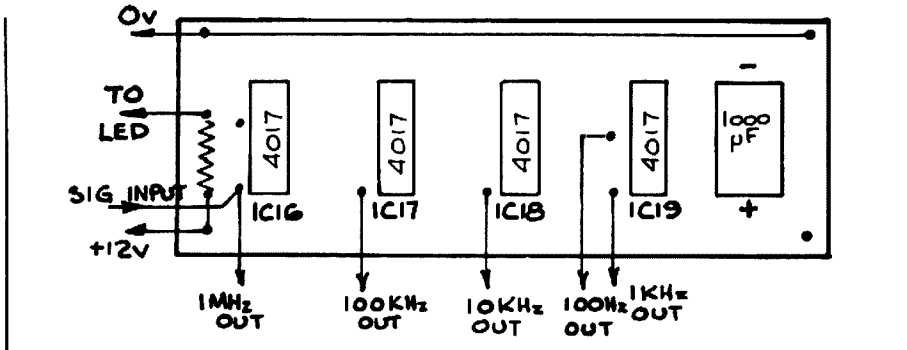


Figure 12 — Board 4 Layout.

d. IC14 4046 Phase comparator and VCO.
e. IC6 4049 Hex Inverter, Buffers, etc.
f. IC15 74C30 Summing gate.

NUMBER TWO. Programmable Divider — Figures 3 and 10.
Contains five integrated circuits.
a. X 1 MHz IC8 4017.
b. X 100 kHz IC9 4017.
c. X 10 kHz IC10 4017.
d. X 1 kHz IC11 4017.
e. X 100 Hz IC12 4017.

NUMBER THREE. 10 MHz Clock/100 Hertz — Figure 2 and 11.
a. TR3 (BC108 or similar) Internal 10 MHz Shaper/Amp.
b. TR4 (BC108 or similar) External 10 MHz Shaper/Amp.
c. IC5 7404 CMOS to TTL, plus buffers for items (a) and (b), as well as spare.
d. IC1 74LS90 Divide by 10 to 1 MHz.
e. IC2 4518 Dual divide by 10 to 10 kHz.
f. IC3 4518 Dual divide by 10 to 100 Hz.
g. IC4 78LO5 Five volt regulator.

NUMBER FOUR. Down Range Extender — Figures 5 and 12.
Contains four integrated circuits.
a. IC16 4017 Divide by 10.
b. IC17 4017 Divide by 10.
c. IC18 4017 Divide by 10.
d. IC19 4017 Divide by 10.
Total available division is 10 000.

The same method of construction is used for each board, and to avoid being repetitious, the construction of number one will be detailed here.

Free use is made of "circuit test pins (Cat No H5590) and are shown thus * on the circuit diagram. They are used for transistor connections, power supply feed, all buffer inputs and outputs (used or not) signal in and out for each IC, and other points as and when required.

Sockets are provided for all DIL integrated circuits and are the first items soldered into the boards. Next comes the supply lines, positive along the top whilst the negative runs along the bottom. Solder lugs are organised so that their holes coincide with the board mounting holes and are positioned so that they may be soldered to the earth pins.

Now run the IC earth leads, using bare tinned copper wire and/or any convenient tracks. Likewise, the inter-connection links, not forgetting the Vcc (positive) supply, and then followed by the inter-chip wiring using insulated wire. Wherever possible wiring is run along the upper surface and soldered underneath, or to circuit pins.

Earth the unused buffer inputs (***not outputs***), fit resistors and capacitors.

Before going further, inspect your work under a strong light. Remove possible shorts and resolder any dubious joints. When completely satisfied, wire In transistors and the 78LO5 regulator.

The IC pin spacing must now be adjusted to suit that of the socket. This is done as follows:

Hold the chip firmly using both hands, press down firmly against the bench top, and tilt the IC slightly. The opposite side is treated the same way. *Carefully does it* are the operative words here. Better to have two or three attempts than to finish with mangled pins.

Now carefully insert the chips into their sockets, making sure that you have them polarised correctly. The board is now complete and hopefully without errors or omissions. If confident, mount it into its appointed space on the chassis. Maybe it would be prudent to make one final check? It is surprising how simple errors creep in when one is in too much of a hurry. My advice is not to hurry as there is always another day!

The remaining boards are handled in a similar manner, complete but do not, at this stage, mount board four.

Run the 12 volt supply to each board in turn, followed by the few inter- board connections and then the four wires to the "Lock" indicator. Do not fit, at this time, any switches, etc except the power ON/OFF one. Their absence, together with all of the associated wiring, gives a lot more "elbow room" during preliminary testing.

TRIAL RUN

Run five temporary connections from the summing gate to the programmable divider:

1. IC15 (74C30) to IC8 (4017) pin no 2 = 1 (1 MHz)
2. 74C30 to IC9 (4017) pin no 1 = 5 (100 kHz)
3. 74C30 to IC10 (4017) pin no 3 = 0 (10 kHz)
4. 74C30 to IC11 (4017) pin no 3 = 0 (1 kHz)
5. 74C30 to IC12 (4017) pin no 1 = 5 (100 Hz)

Switch on and check that the correct Vcc appears at the right places. If the clock oscillator has not yet been set, do so now using your counter or the station receiver tuned to WWV, etc.

Move the counter to the buffer output pin (No 4) of the 4049, on Board One. Using an insulated trimming tool, adjust the VCO trimmer (TC1) from minimum towards maximum. If all is well, the counter display will suddenly jump from random counts to a rock steady 1.5005 MHz. The "Lock" indicator should now glow steadily. Nil or pulsing display means zero or only partial lock.

FAULT FINDING

Failure to lock indicates a wiring error or a faulty component. Fault finding with a CRO is relatively easy, however, for those without a CRO it will be much more difficult. Don't despair as many checks may be made using your receiver, and/or multi-meter.

Use your receiver to verify that the clock oscillator is running and then that the divider board is producing the correct frequencies. If this is happening Boards Three and Five are clear.

The programmable divider may be tested as follows:

A little extra wiring is required, all of which is temporary and is merely to enable one to assess the *operation* of this board. Disconnect the reset line and tie to 0V. Re-route the divider input to the TR1 collector and then connect the level converter (TR1) to the 1 MHz output of Board Three. A capacitor and diode detector will allow the use of the multi-meter as a signal tracer. If you are satisfied that Board Three is counting then the fault must be either in Board One or the inter-board wiring. Remove the offending board from the unit and arm yourself with a copy of the circuit. Remove all ICs. Now check for unintentional shorts between every chip connection. Then test the circuit through, step by step. Ensure that every earth shown on the diagram has been made. Some of the ICs use multiple earths and will not operate correctly if one has been missed.

DECADE SWITCHES

Having arrived at the stage of having the unit "up and running," attention is now directed to the installation of the five decade frequency selector switches. They are fitted and tested, one at a time. Due to the limited space inside the case, it was found easier to pre-wire them before assembly onto the front panel. The use of different coloured wire makes for easier sorting at the board end. The author used wire which matched the standard resistor code. Rainbow flat cable is an easy way to obtain such an array of colours.

Commence at the 100 Hz end and fit the switch. Remove the temporary wire No 5, then connect the 10 wires to their assigned places. Ten go to IC12 (4017) and the 11th goes to pin 2 of the summing gate.

Verify your work by connecting the counter and rotate the switch from zero through to nine. The output frequency should increment from 1.5000 to 15009 Hz in 100 Hz steps.

The process is then repeated for the remaining four switches. Note that the X 1000 is a two-pole, four-position type.

Section "a" is wired to pins 3, 2, 4 and 7 of IC8, corresponding with frequencies of zero, one, two and three megahertz. The "B" pole is used to switch-in extra capacity to the VCO circuitry to allow operation down to 100 Hz in the "0" MHz position.

Considerable jitter creeps in at the lower frequencies and is reduced by introducing an extra 1.5 nF capacitor via the "LF" switch.

FINAL ADJUSTMENT

This may be accomplished using the station receiver, however, a counter and CRO will make the exercise a little easier.

Proceed as follows:

HIGH FREQUENCY LIMIT

1. Turn TC1 to maximum C.
2. Set SW1 to "3" and switches 2 through 5 to "0." (The "Lock Indicator" will most likely not be "On" or it may flicker).
3. Tune the receiver to 3.0 MHz.
4. Slowly tune TC1 towards minimum. A point will be reached where a strong signal will suddenly appear on the receiver and the "Lock" will settle to a steady glow.
5. Leave SW1 at "3" and set SW2 to "5" (3.5 MHz).
6. Retune the receiver to 3.5 MHz and repeat step 4.
7. Repeat at 100 kHz intervals until maximum lockable frequency is reached.

The author's prototype struggled up to 3.9990 MHz, albeit with an excessive locking time.

MID-RANGE FREQUENCIES

8. Turn SW1 to "1" and all others to zero. Check for lock and 1 MHz signal on your receiver.
9. If okay, rotate other switches to 9999 and verify frequency. "CX" will need to be reduced if unable to reach 1.9999 MHz.

LOW RANGE FREQUENCIES

10. Set SW1 at "0" and "LF" to OFF Use "Counter" to check output frequency at all switch positions.
11. Connect CRO to output. "Jitter" should be apparent on the waveform at frequencies below approximately 100 kHz.
12. Switch "LF" on. The "Jitter" should now stop. If still evident, increase the 1.5 nF capacitor slightly. Do not use more "C" than required.

FUTURE PLANS

These include substituting a XR2206 chip in lieu of the 4046s VCO section. The idea here is that sine, square and triangular waveforms would then be obtainable.

Then, of course, a low impedance emitter follower feeding into a calibrated switchable attenuator, and maybe an output meter could be considered.

Alternatively, one could stay with the square wave only configuration and use a 74 HC 4046. This IC utilises 3.5 μ silicon gate ρ well technology to obtain high frequency operation. It is specified to give a typical frequency of 18 MHz with a VCC of six volts.

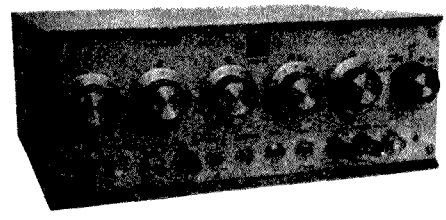
Heavens, quickly secure the lid, before any more possible features (and more work) are thought of.

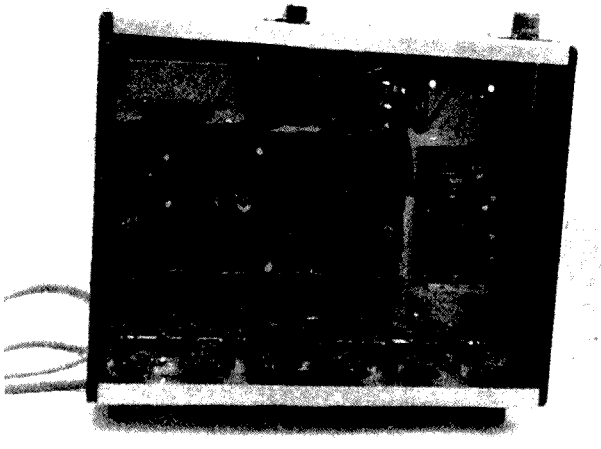
A full Parts List has not been prepared for this project, however most of the hardware items come from *Dick Smith Electronics* stores. These include the power transformer, case, sockets, circuit pins, DIL boards, knobs and toggle switches. The semi-conductors were purchased from *Rod Irving Electronics*. Minor components were obtained from various other suppliers, including the "good-old Junk Box."

Thanks are extended to Mrs B Brown for typing this article.

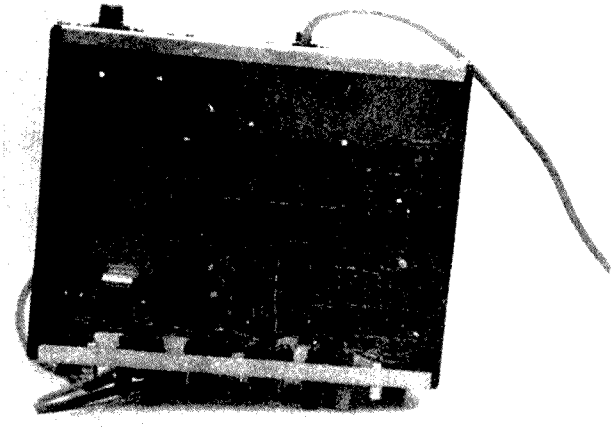
References:

1. 10 MHz Temperature Controlled Oscillator, *Amateur Radio*, September and October 1986.





Internal View from top.



Internal View from bottom.

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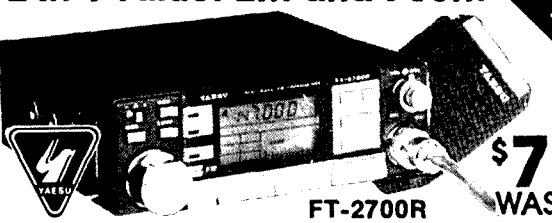

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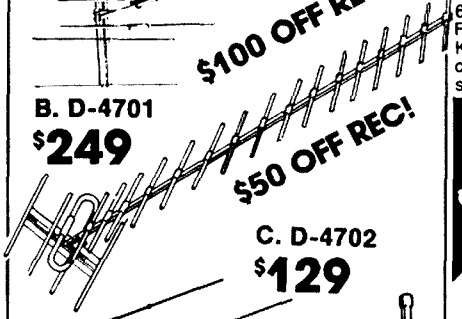

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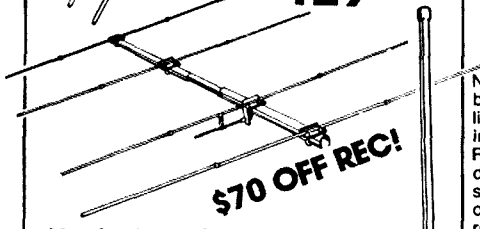

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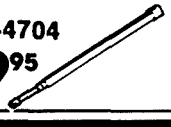

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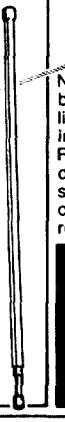

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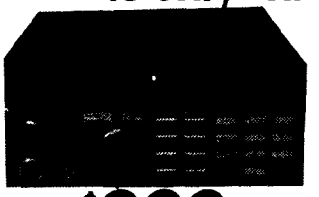

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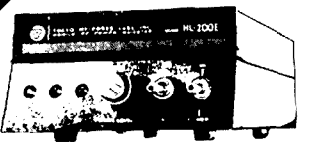

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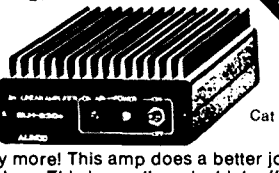

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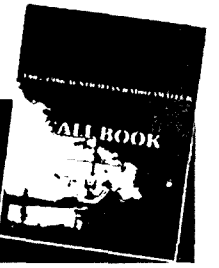

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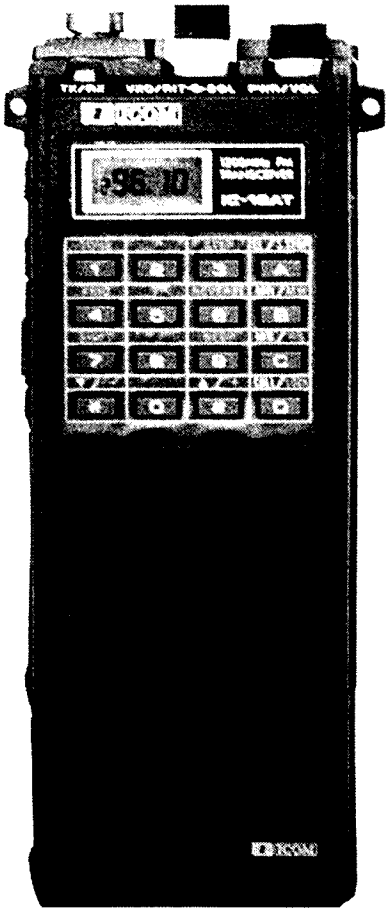
Equipment Review

ICOM IC12AT 1296 MHz FM HAND-HELD TRANSCEIVER

By Gil Sones VK3AUI
In collaboration with:
Kevin Phillips VK3AUQ
Lionel Curling VK3NM
Peter Ford VK3YTB



Ten years ago, hand-held transceivers had established their place in amateur radio. They had limited channel capacity and their features were limited.

Icom have now released a 1296 MHz hand-held radio with all the features of their 144 MHz and 432 MHz hand-held radios. Just to have produced such a transceiver is quite an achievement. The performance of the transceiver is better than that of many fixed stations of 10 years ago. Hand-held radios have certainly evolved during the last 10 years.

The IC12 is a very highly developed hand-held transceiver. None of the features of Icom's other hand-helds are lacking. The IC12 comes with a complete range of memories, scanning, priority, call channel, tones and repeater operation.

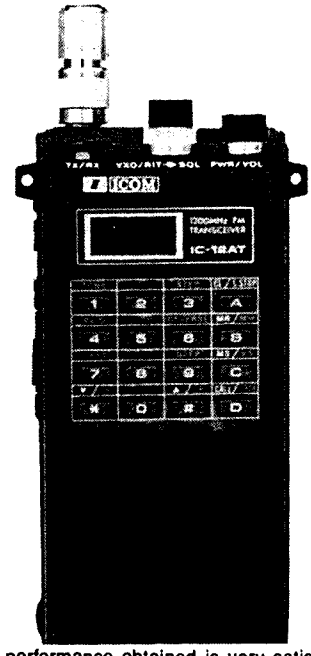
Usage of the 1296 MHz band presents a problem in testing equipment on air. However, with two units to test and the assistance of home stations, the capabilities of the IC12AT were assessed.

When first delivered, there were some qualms about the safety of use of the hand-helds. This is not peculiar to these hand-helds, but applies to any hand-held transceiver. The critical factors are the power radiated, the length of the aerial, and the distance from the operator. A higher powered hand-held with a short aerial can approach the limits for exposure to electromagnetic radiation.

Calculation of the likely electromagnetic radiation from the IC12AT indicated that it would be well below 10 mW per square centimetre under normal operation. This was later confirmed by direct measurement using an RF Radiation Monitor.

Performance measurements at 1296 MHz require relatively sophisticated test equipment. In order to obtain the figures shown, the two hand-held radios were passed to Kevin VK3AUQ. The results are shown in Figure 1.

Below: Close-up view of Key-pad and LCD Display.



The performance obtained is very satisfactory and is remarkable from such a small radio. The transceivers were operated from battery packs, so the performance is the actual performance obtained in use.

Figure 1 — Receiver Sensitivity.

ICOM IC-12AT	S/N 01097			S/N 01098		
FREQUENCY	1260	1280	1299	1260	1280	1299
Mute opens	.08 μV	.07 μV	.08 μV	.07 μV	.06 μV	.07 μV
SINAD 12 dB	.23 μV	.19 μV	.25 μV	.25 μV	.21 μV	.25 μV
Receiver Audio O/P		>500 mW			>500 mW	
Distortion at 500 mW		7.6%			5.3%	
Distortion at 50 mW		6.8%			3.3%	
Receiver Current Muted		82 mA			80 mA	
Receiver Current Full Audio		230 mA			230 mA	
Transmit O/P Power High	900 mW	830 mW	890 mW	690 mW	670 mW	730 mW
Transmit O/P Power Low	91 mW	86 mW	74 mW	92 mW	87 mW	84 mW
Deviation		4.5 kHz			4.8 kHz	
Spurii Only Spurii		2nd Harmonic			2nd Harmonic	
			-50 dB			-56 dB
Frequency (Ambient 20 degrees Celsius)		1.8 kHz low			-1.1 kHz	
Transmit Current High	1.1 A	960 mA	870 mA	1.01 A	940 mA	885 mA
Transmit Current Low	490 mA	435	376	500 mA	450 mA	410 mA
FREQUENCY	1260	1280	1299	1260	1280	1299
ICOM IC-12AT	S/N 01097			S/N 01098		

Battery consumption done with 12 volts external and battery pack removed.

Field tests were carried out with the assistance of Lionel VK3NM and Peter VK3YTB. Home stations also assisted with tests. Les VK3ZBJ, provided contacts to various sites in Melbourne's eastern suburbs over distances of 35 to 40 km.

The IC12AT was very simple to operate. Signals were very clear with excellent audio quality on both transmission and reception. Flutter was greater than on two metres, but did not detract from reception.

Penetration of the signals through buildings, vegetation and hills was not as good as at two-metres. However, this was tested to extremes. The coverage overall was particularly good. A well sited home station gave excellent coverage to a mobile hand-held. Similarly, contacts of around eight to 10 km were maintained, hand-held to hand-held with suitable suburban terrain. Both ends of this contact were in elevated, but locally obstructed conditions.

A repeater on 1296 MHz would really make the IC12AT shinel Excellent coverage with small aerials would be obtained.

Battery drain is somewhat greater due to the circuitry which must be used. A spare battery pack would be a good acquisition. The batteries are NiCad and a suitable charger is supplied.

Another alternative is to use a spare pack of alkaline cells. This can usually be replenished without the waiting time for NiCads to charge.

Overall, the IC12AT is an excellent hand-held transceiver. Quite surprisingly good results were obtained.

The concept would have been an impossible dream, 20 years ago. Only 10 years ago, it would have been still a pipe dream. Today the IC12AT is an achievement loom can be proud of.

AT A GLANCE EVALUATION OF THE ICOM IC12AT HAND-HELD TRANSCEIVER

Serial Nos 01097 and 01098

APPEARANCE

Packaging
- ***Single carton with foam insert. Individual packaging of accessories and transceiver inside.

Weight and Size
- ***Not the lightest hand-held, but very acceptable.

External Finish
- ****Very well finished combination of metal and plastic.

Construction Quality
- ****Excellent.

FRONT PANEL

Location of Controls
- ****A very neat layout. Well thought out.

Size of Controls
- **Pretty hard to make them bigger.

Labelling
- ****Excellent.

LCD Display
- ****Excellent, with status indicators and light if needed.

RECEIVER OPERATION

Sensitivity
- ****Excellent.

Received Audio
- ****Excellent.

Memories
- ***Ten, with priority, call frequency and repeater offset.

S-Meter
- ***Bar-graph for comparative use.

TRANSMITTER OPERATION

Power Output
- ***Very good considering size, the frequency and the battery operation.

Transmit Audio
- ****Excellent.

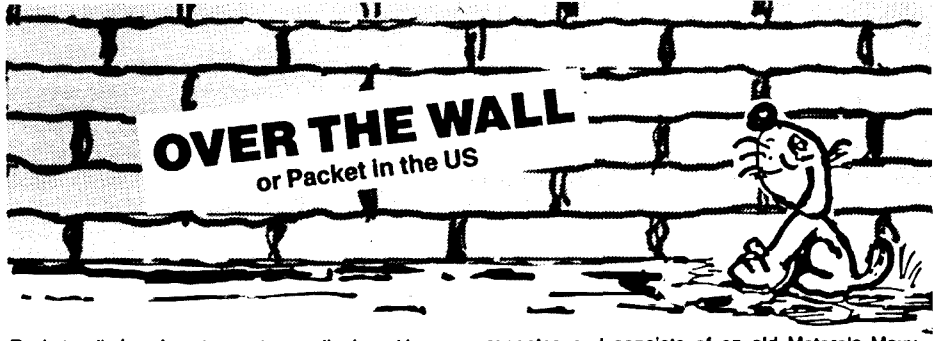
Output Indicator
- ***Bar-Graph of relative output.

Instruction Manual
- ***Comprehensive manual covering all aspects of operation. Circuit provided.

Overall Rating
- ****An excellent hand-held radio, which is even more remarkable considering the operating frequency.

RATING CODE

* Poor; ** Satisfactory; *** Very Good; **** Excellent.



Packet radio is unique to amateur radio. I read in a recent newspaper article that amateur radio operators were generally considered to be a group very "tolerant of eccentrics," presumably because the hobby is generally solitary. Until packet radio came along, amateur radio consisted mostly of interaction between man and his radio. If you could not get your voice heard or message through with 50 watts, well, crank up the power or tune the antenna. There was very little co-operation required between amateurs; and when it was, a few could (and can) mess up everything.

Packet changes all of that. Without a well-designed communications protocol, we could not recognise anything coming from somewhere else. Without a lot of co-operation and goodwill, our very fragile network of digipeaters will simply stop working. That is why the extension of digipeaters to the western slope and on to Utah, and theoretically to California, is such a remarkable feat. California has W6AMT, with 12 or so digipeaters bearing his call sign, to form the backbone of WESTNET. The east coast has many amateurs who can get together to buy and put up a digi here and there.

We have some wonderful sites, but darned few people and even less money; but with what we have, we've built a successful Level 2 link between Denver and Salt Lake City. Now that the sites are there, and people are used to the strange buzzing noises they sometimes hear on 145.010 MHz, we will be ready when true Level 3 networking comes, with higher speeds and better channel utilisation. Until that happens, though, we are stuck with what we have got, which is a link that works — sometimes. Here is some information on the Colorado portion of the link, and to the extent I know about it, the people who helped put the digipeaters up!

N0BRI-1 is the first link in the chain. It is located on Santoy Mountain, near Kremmeling, several metres from the Kremmeling VOR, a well-known aircraft navigational aid. Since it is located approximately 75 miles (120 km) due west of Boulder, it ought to be easy to hit it — but the continental divide is in the way! However, K0ZCO (and several others) in Denver, KE6LT in Boulder and W0HJX in Greeley have been able to work this digipeater consistently. The digi was installed earlier this year by N0BRI, whose name in the call book is Louis, but everyone calls him Sunshine. He lives in Eagle, and is an electrician in Vail. The digipeater runs 25 watts and uses a Kantronics TNC. Ironically, Sunshine cannot work his digipeater from his house. It also does not hit Vail, and Sunshine and Phil W0KEA, will probably install another digipeater on Bellyache Ridge, between Eagle and Vail so that Phil can use packet. The Eagle/Vail amateurs have been very active in the use of packet to exchange golf scores during the Annual Jerry Ford Golf Tournament.

N0BRI-1 has also proven popular with vacationers, and given the terrain, it should be able to connect to N0CCZ-1, which is just over 100 miles (160 km) to the south-east. Some of the links in Utah are over 200 miles (320 km) and they seem to work well. However, no one has thus far been able to get from Santoy to Colorado Springs directly.

About 59 miles (94 km) south-west of N0BRI-1 is K0GUZ-1, which is located on Sunlight Peak, which in turn is at 10 500 feet about 12 miles (19 km) south-west of Glenwood Springs. This digi was installed in May 1985, so it has the distinction of being the oldest one on the western slope. It was a joint venture between a lawyer, Bob KI0G, and the county judge, Steve K0GUZ, and a computer consultant and instructor, Bob K9MWM. The digi is in the same building as the K0CL 07/67 repeater, and consists of an old Motorola Moxy single-channel rig running 18 watts or so, and a GLB TNC. The combination has proven extraordinarily reliable, which is a good thing since the site is not accessible during the winter except on snow shoes or by snow cat.

There are several active packet stations served by this digi, including K0GUZ and Mel W0HLD in Rifle, KI0G and K9MWM in Glenwood Springs; Neal K0TIV in Carbondale; and Rob K0YBX in Aspen.

The next digipeater is W0RRZ-1, Grand Junction, located on Black Ridge, just west of Colorado National Monument. W0RRZ-1 is 79 miles (136 km) from Sunlight, but the path is unusually excellent —except during the hot summer when it almost seems as if the shimmering heat waves distort the signals so much that it is not entirely reliable. The digi has been installed be several people who have formed a western slope club; among them were, KA0WCZ, WB0ECV, KA0SLV, KC0GU, W0MTK, WB0PDU, and KB0NF KB0SW, in nearby Collbran can also use the digi. Most of these amateurs are actively engaged in computer engineering or are employed in communications, working for Mountain Bell, GTE Spacenet or one of the local television stations.

Earl KA0WCZ, has succeeded at the monumental task of writing, from scratch, a W0RLI/WA7MBL bulletin board system in Basic to run on his S-100 bus system. The BBS, KA0WCZ-1, has now been on the air for several months, and most of the bugs have been worked out of it. It will automatically receive and forward messages to the eastern slope and send and receive files (within reason) and monitor the frequency. . .just as the others will do.

Located on Blue Mountain, near Dinosaur, CO, is the newest digi, WB7WAB-1, alias BLU. BLU is located 95 miles (152 km) north-west of K0GUZ-1 and 77 miles (123 km) due north of W0RRZ-1. It should be possible to hit it reliably from either one. It is the first of the digis in the chain installed by the "Utah Group," which has been actively installing digipeaters fanning out from Salt Lake City. First, they reached Los Angeles, now they are going north to Boise, east to Colorado and west to Reno, Nevada.

The only person to be reached on this digi is Gary NB7B, who has had a packet rig in Vernal, Utah for 16 months and nobody to talk to.

Then, there is another digi in central Utah, 25 miles (40 km) north-west of Price on Ford Ridge, near Scofield Reservoir. It is KD7YG-1, alias FORD. This provides a reliable link to Snowbird, a mountain-with-ski-resort located at 11 000 feet, near Salt Lake City. The Snowbird digi is KD7YK-2.

From KD7YK-2, I have worked the WA7UZO bulletin board; WA7YAZ, KA7WAG and N7BHC, all in the greater Salt Lake area. KE6LT and W0HJX, among others, have at least managed to connect to Salt Lake City from the Denver/Boulder/Greeley areas using these paths (via N0BRI-1, K0GUZ-1, BLU, FORD, KD7YK-2) but the connection is not very reliable.

From Salt Lake City you can theoretically link south of Provo, then to Cedar City (a leap of nearly 200 miles (320 km); Las Vegas and then Los Angeles. That is the theory, but in practice it is somewhat different: nobody has been able to do it so far!

Everyone keeps repeating it: the 145.010 MHz digipeaters were never meant to handle long distance networking. However, assuming that everything is working and everyone co-operates to avoid hogging the frequencies, they do a pretty good job.

—Written by K0GUZ in the *RMPRA > PACKET* and taken from *Gateway, The ARRL Packet-Radio Newsletter* Vol 3, No 4

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EDUCATION

EQUIPMENT REVIEWS

GENERAL

THUMBNAIL SKETCHES

TRY THIS

WIA NEWS

WICEN

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Minami Tori-shima*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0SJ	*Macquarie Island (Keyer)*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*[1]
52.325	VK2RHV	*Newcastle*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RBB	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*[1]
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*[1]
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.450	VK3RAI	*MacLeod, Melbourne*[2]
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1 Correction to location — my original report last April was correct. A note in the *North West Amateur Radio Society Newsletter* for October 1986, which says about the location... "All was fine until August 1986, when the WA VHF Group got in on the act and told everyone the beacons were now at Port Samson (Karratha), that is pretty close I suppose, only 60 or so kilometres apart. Then comes September AR and it was in Karratha!" The correction has been noted and the listing changed as from this issue. Will the WA VHF Group also please note for their list. . .VK5LR

2 A further note from Ian VK3AQU, advises the need to correct the frequency of his 70 cm beacon from 432.475 to 432.450 MHz. This has been duly changed this month, also. Plans are in hand to raise the power level from the present *one* watt to the maximum of seven watts as allowed under his licence.

THE NORTH-WEST

From the *North West Amateur Radio Society Newsletter* comes the news of some exciting two metre contacts. On September 10, 1986, from 1200 to 1255 and on September 11, around 1545, contact was established between Dougall VK4KUY/6, on Koolan Island and the Darwin Channel 8 Repeater and stations worked included VK8s ZWM, LM, DI, ZED, PC, KJJ, and TA. Dougall made the contacts with 30 watts to a nine element Yagi. The distance is about 900 km. This appears to be the first time such contacts have eventuated.

Also a first was the two-way contact between Brian VK6AIH, in Port Hedland and Ron VK6UF, on Koolan Island on two metres, the distance being about 750 km. Contacts with Ron should be easier now that he has lifted his power to 200 watts.

Repeater VK6RCA, at Carnarvon is operational with 146.075 input and 146.675 MHz output and is being looked after by Jim VK6CA. Tests were to be carried out in October from the Carnarvon Lighthouse, which is a tower more than 30 metres high, right on the coast and, if successful, should suit ducting up and down the coast.

A new operator on six metres in Port Hedland in Peter VK6BB, who has 100 watts to stacked Yagis and is keen to see the Es season start. Perhaps he will not have to wait too long as Dave VK6YA, had a short contact with JH8MQZ/5 on 52.050 at 0830 on September 12. The JA also reported hearing the VK6RTT beacon quite well.

It is good to see the measure of activity taking place in the north-west, as area nicely situated for contacts to Indonesia, when conditions permit. It is noted that regular use *is* being made of the various repeaters to give indications of ducting.

It is of interest to note that the Newsletter is sent to 29 amateur operators in the area above Geraldton. How many are actually operating on VHF is not known, but it does indicate an area of considerable amateur interest and VHF operating does seem to be on the increase there.

THE BRAID-BREAKER

From the same newsletter is some information said to assist in curing the ills of television and VCR interference. The source of information is from the *RSGB Television Interference Manual* and the diagram of the "Faraday Double Loop TV Receiver Filter" is shown herewith and may assist those who are being troubled.

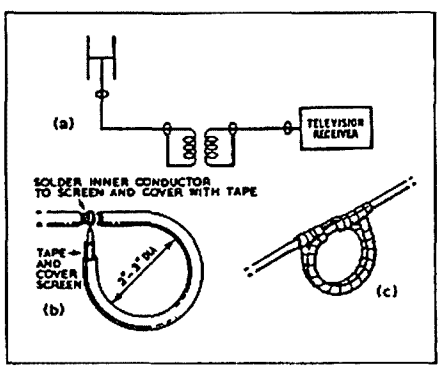


Figure 8.4 — Faraday double loop TV receiver filter. (a) Basic arrangement of filter; (b) detail of one loop; (c) two identical loops are put together, taking care to insulate all wires/screens and taped or laced firmly.

EME ACTIVITIES

Doug VK3UM, advises conditions have not been too good lately but the following have been some of his random contacts: 26/7 — 1345 UTC N4GJV received 43 sent 45; 2245 SM4IVE 349 339; 2307 DF3AU 459 459; 2330 DL9KR 559 449.

On 7/9 at 0730, ZS6JT 0 reports both ways despite the 30 foot (9m) dish at the other end, conditions were just so poor. 26/9 2300 OE9HHV M reports; 2330 SM7GEP 0 reports; 27/9 0000 DK0NA 0 reports; 0020 DF3RU 339 339; 0030 HB9SV 439 439.

Compounding problems in the VK3UM shack was a king-size flame-out of the 4CX250B linear with both valves ruined. This occurred whilst Roger VK5NY, was making a State Visit, so naturally he receives the blame! VK5LP sent over a parcel of 4CX250Bs which hopefully will get Doug back on the air.

NEW ANTENNAS AT DROUIN

David VK3AUU, has shifted QTH and is now located at Drouin South and is 400 feet (121m) ASL. He reports: "I have just finished building a couple of new antennas. The six metre one is nine elements on a 36.5 feet by two inch boom and the two metre one is 19 elements on a 38.5 feet by 1⅝ inch boom. As well as those, I also have 33 elements on a 27 feet tapered boom for 70 cm. All are basically DL6WU antennas with 1:1 folded dipoles and 4:1 halfwave baluns, but the element lengths are calculated using an algorithm which I have produced from a set of DL6WU figures. The driven elements are 1:1 folded dipoles which give 200 ohms at the feed-point.

"The two metre Yagi is virtually matched across the whole band and the gain is estimated at 16.8 dBd from the beamwidth of 23 degrees. I can hear in excess of 7 dB of noise from Sagittarius A with a 3SK97 GaAsFET preamplifier mounted where the antenna joins the mast. The Mount Gambier Beacon is now there all the time, even with Trevor's (new) antenna and the Canberra Beacon fades in and out of the noise most of the time, unaided by passing aeroplanes. Ian VK1BG, can always hear my CW and, in fact, I have worked VK1 or VK2 on 11 days out of 16 since the new antenna went up. On 29/9, at 4.30 am local time, I copied Chris VK5MC, back off the moon quite well, which I could not do with an 18 feet Yagi. Tests on the local beacon indicate about a 10 dB improvement in received signals with the new beam about 10 feet higher than the other one and the preamplifier a bit closer to the antenna. I *hope* to put up four of these monsters, stacked 16 feet apart, in the autumn.

"The six metre version is cut for 50.100 MHz and it does seem to do okay at that frequency but does not do very well at 52 MHz, but I have not doe any measurements on it yet." (Probably would have been better cut for 51 MHz when it would have probably been very reasonable over about 2.500 MHz. My eight-over-eight system does not rise above 1.4 to 1 from 50.000 to 52.600. . .5LP).

"The 70 cm antenna gave trouble in matching and finished up with a T-match and a universal matching stub into a 4:1 balun. It has a beam width of about 17 degrees, but that was measured on sun noise which only gets up to 5 dB, so is not accurate. However, the sun noise is above 4.5 dB from 430 to 440 MHz with a 3SK97 on the boom about 18 inches from the feed. I have heard K2UYH, but cannot hear VK3UM off the moon. I have a 39 feet long 49 element antenna partly constructed, just to see how far you can go, but will probably settle for four by 19.5 feet antennas.

"I have also built a 26 feet high tilt-over tower on which the three Yagis will be mounted for this summer, 50 MHz at 26 feet, 432 at 32 feet and 144 at 40 feet. I have 150 watts on 50 and 144 and 80 watts on 432. I hope I can be one of the top Ross Hull stations this year, but, unlike a lot of others, my activity will not cease after the contest."

Thanks for the letter David, and now that you have retired we are looking forward to some very good signals out of Drouin, which is located about 92 km ESE of Melbourne.

WESTERN AUSTRALIA

I was pleased to receive a letter from Don VK6HK, which he said was a result of him being "named" in my column as one who should be contributing to the *DX Standings Column* and he comes up with a list commencing in 1951.

Some curiosities which Don lists are:

1 23/9/58 at 0252 KA2DS Japan CW 559 heard on 50 MHz. This was a very early record of Japanese reception in Western Australia. At this stage, 56 MHz was the only band allocated, 50 to 54 MHz having been resumed for the original television channel 1 (49 to 56 MHz). The operator was an American serviceman operating from Tachikawa and Don still has his card and letter of verification of the reception. Don asks; "Any earlier reports?"

2 12/4/82 0600 9VG58 from Singapore CW 549 on 50 MHz. This was the third harmonic of a commercial CW station operating in the 16 MHz band.

3 12/4/82 0601 VPS80 source unknown CW 579 on 50 MHz, also a harmonic from commercial HF

Both these stations are of interest but not counted in his list.

Don also says "It was an interesting exercise digging in the old logs and cards for the odd detail. One has cards for the old WAS, Worked all ZL Districts, Worked all JA Call Areas in profusion, but not a lot of different countries. Congratulations to VK8GB/2BA/4ZJB etc. Their scores translate into a lot of operating application. Talking with VK6WD over the weekend and we agreed it is a good idea to record what has been workable over the years.

"Until recently, there has been a keen group of ATV operators on almost every day on 70 cm. I have participated but not for some time. The gear can run 100 watts peak sync out if required, although coverage around the city is surprisingly adequate with only 10 watts from the solid-state DSB mod/exciter. Best DX is about 100 km down the coast in tests with VK6KZ/P.

By the way, one of the former stalwarts of six metres activity, Andy VK6OX, has recently moved to Perth from Carnarvon and has been trying to sell his gear. Perhaps it is only his HF gear? ? ?" I sincerely hope so Don, it would be a pity to lose Andy from the VHF-ranks. . .5LP.

FIVE METRES — AGAIN

Last July, I published a letter from John VK5UL, referring to happenings on the old five metre band, plus his involvement in the early radar applications.

This letter created more than a little interest and several correspondents have commented on it in passing. However, Keith Heitsch VK4HK (formerly VK3HK), carried out his own research on early five metre operations and from the large amount of information sent me, including a photocopy of the relevant pages of his log book, I have put together the following for the interest of readers.

Keith originally lived at Mitcham, east of Melbourne, and the saga appears to have started with the return of the amateur bands after World War II and in 1946 quite a high degree of activity was taking place on 50 Mc/s (not MHz then!), and for many months before the summer period, Keith kept nightly scheds with Eric Thomas VK3ZL of Ballarat. Results were variable, sometimes they only just got through whilst at other times signals could be S4 or S5. They concluded the chances of working interstate were rather remote, but they would keep trying.

Keith had five metre equipment mounted in his private car, operating on 51.4 Mc/s, MCW and phone. On 30/11/1946, he went on to Mount Dandenong hoping that elevation might assist him to contact distances. He worked VK3MJ, VK3NW, VK3ABA and VK3GG, all during the afternoon. On his way home at 1705 local (all times for this purpose of this historic exercise will be local) he heard VK4ZU testing. Each time he put it by Keith called him but no answer, despite copying him 5x6. VK4ZU was on 52.1 for about one hour.

It did not take long for the news to get around Melbourne, so next day there were many stations calling CQ DX on 50 Mc/s. News came through on 40 metres that VK2WJ in Maroubra, New South Wales, was hearing VK3HK but no one else, frequency 51.3. His card says "Congratulations on first 50 Mc/s DX." Time was 1830. At 2012, Keith heard a station being either VK2FP or VK2FB at 4x4.

On 2/12/46, a lot of time was spent throughout the day calling CQ DX until finally, at 1830, VK2OC was called on sched in response to a telegram received earlier in the day saying; "Your six metre sigs received 7.15 pm yesterday please sched tonight 6.30 and 7 pm and listen 3583 kc/s for reply. . .VK2OC." No contacts resulted from the calls and the 80 metre link was too noisy and VK2OC was not heard. Lots of further DX calling took place during the next two days but only local contacts resulted.

Finally the barrier was broken. At 1900 on 5/12/46, VK3HK was called by VK2NO (Don) in Sydney on 50.4 Mc/s and a two-way contact resulted, Keith sending 5x8 and receiving 5x7, thus becoming his first interstate contact. At 1910 he called VK2AHF and worked him at 5x9; 1917 VK2WJ 5x9; 1925 VK4RY; 1945 VK4HR 5x9; 1955 VK4XG 5x6; 2003 VK4ZU 5x9; 2023 VK2AZ 5x7; 2035 VK2LZ 5x6; 2118 VK4HR 5x9 and 2230 VK3MJ 5x9.

The next occasion was on 9/12/46, when at 1910 VK4HR, was 5x9; 2000 VK4FB 5x6 and 2025 VK4AP 5x7; all around 50.7 to 50.9 Mc/s. A letter from M Tomkins at Bundaberg reported reception of VK3HK there from 7 to 9.30 pm at S3 to 7. Thus the signals were settling into the now familiar 1000 miles- plus optimum path for Sporadic E.

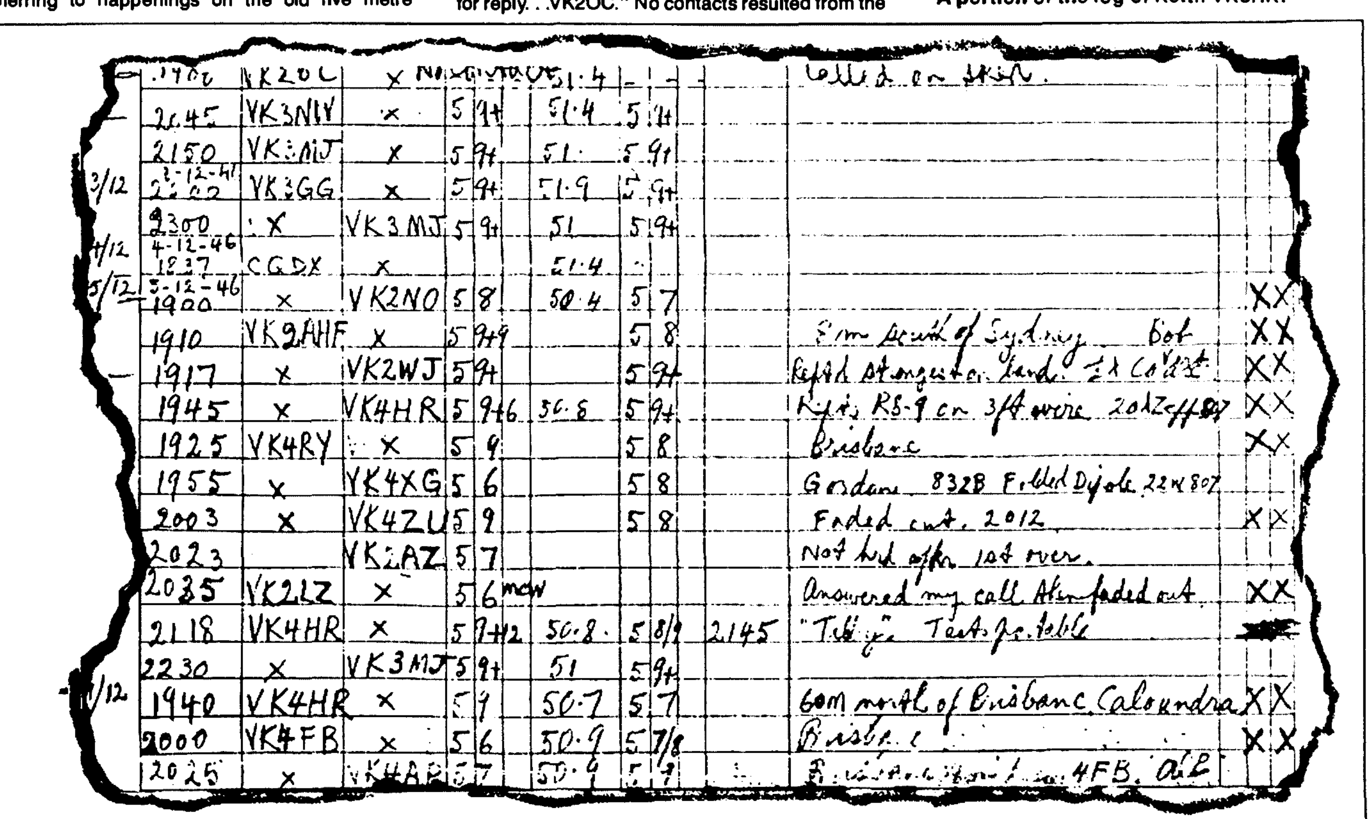
Referring to that first contact with VK2NO, this station sent a telegram to VK3NW in which Don said Keith's signals eventually rose to S9 +20 dB, so the band was probably just opening up at the time of the original contact. Keith VK4HK, is now asking is this contact between VK3HK and VK2NO was the first interstate contact in Australia on 50 Mc/s? That is a question I cannot answer, but there may be some reader who can help. It would be of historic interest to know when the first contact was made on that band, bearing in mind that other bands were also being tried at the same time; eg 112 Mc/s etc.

A copy of that all important section of the log of Keith VK3HK is included in this column and your attention is drawn to some of the comments in the "remarks" column. QSL cards are held for VK2NO, VK2WJ, VK2OC and VK4ZU.

LETTER FROM JAPAN

JA1VOK sent a letter dated 16/9 (just too late for last month), in which he says six metres opened to VK4 on 12/9 and 14/9 for the first time during their

A portion of the log of Keith VK3HK.



	1900	VK2OC	x	No signals		51.4	-	-		called on sked	
	2045	VK3NW	x	5	9+	51.4	5	9+			
	2150	VK3MJ	x	5	9+	51	5	9+			
3/12	3-12-46 2202	VK3GG	x	5	9+	51.9	5	9+			
	2300	x	VK3MJ	5	9+	51	5	9+			
4/12	4-12-46 1827	CQ DX	x			51.4					
5/12	5-12-46 1900	x	VK2NO	5	8	50.4	5	7			XX
	1910	VK2AHF	x	5	9+9		5	8		8 m south of Sydney Bot	XX
	1917	x	VK2WJ	5	9+		5	9+		[illegible]	XX
	1945	x	VK4HR	5	9+6	50.8	5	9+		[illegible] R5-9 on 3/4 wave [illegible]	XX
	1925	VK4RY	x	5	9		5	8		Brisbane	XX
	1955	x	VK4XG	5	6		5	8		Gordon 832B Folded Dipole 22x807	
	2003	x	VK4ZU	5	9		5	8		Faded out. 2012	XX
	2023		VK2AZ	5	7					Not hrd after 1st over.	
	2035	VK2LZ	x	5	6 mcw					Answered my call then faded out	XX
	2118	VK4HR	x	5	7+12	50.8	5	8/9	2145	[illegible]	
	2230	x	VK3MJ	5	9+	51	5	9+			
9/12	1940	VK4HR	x	5	9	50.7	5	7		60m north of Brisbane Caloundra	XX
	2000	VK4FB	x	5	6	50.9	5	7/8		Brisbane	XX
	2025	x	VK4AP	5	7	50.9	5	9		[illegible] 4FB. OK	

autumn. JE1TGN worked VK4KWX and VK4FXZ around 0810. The VK4s were also finding stations from JA1, JA2 and JA7.

JA1VOK worked VK6ZKG/4 in Cairns at 0750 on 14/9 at 5x7, later rising to 5x9+ with QSB. Later he heard VK4FXX. JE1BMJ and JF1PUW also worked VK8ZKG/4. Channel 0 television on 51.750 was 5x9+ in Japan for an hour from 0745.

Thanks for the letter Yoshi, certainly it pays to keep an ear on the band as one never knows when it will open.

DXPEDITION TO NIUE

By the time you read this, Nev VK4ZNC should be installed on the island of Niue, which is about 4300 km east of Sydney, as he was leaving on November 14. Information on this DXpedition was given in the October issue and your attention is drawn to this. It will not be a particularly easy six metre contact, but well worth trying. I have no information as to operating schedules or frequencies.

FROM BRISBANE

Angus VK4AGQ, together with his letter, sent a copy of his first QSL card from VK2ZAB for their first Sydney to Brisbane contact on 70 cm, which took place on 2/11/85 at 2014 UTC, on 432.300 MHz SSB with signals 5x3. This followed as a result of a suitable tropo opening and the completion of Gordon's new linear. Angus mentions it was not the first VK4 to Sydney as Bill VK4LC had already worked Gordon from Mount Tambourine.

Angus reports the regular scheds on Saturday and Sunday mornings with Gordon VK2ZAB, are always of interest. The shortness of time available to try and exchange a report on 432 at the peak of aircraft enhancement is intriguing compared to the rather longer periods with other types of contacts. Angus says it is rare for Gordon and he to hear one another for more than about 30 seconds on 70 cm, if you miss the 'peak' nothing is heard, so confirmed 70 cm contacts are rare. Lack of space on the antenna tower makes a high gain array difficult for Angus.

Angus continues with regular weekend scheds on two metres to Ted VK4JTW and Erroll VK4ZHL, at Rockhampton. Reports are usually exchanged and, at worst, carriers heard. 70 cm is more difficult, with only a few phone contacts. Liaison is on 3.620 MHz.

A further paragraph reads; "There is still the tendency as usual for all stations to automatically arrange with another to try SSB on 144.100 (why not some other?), often with the ubiquitous slim Jim or vertical beam incapable of hearing weak DX. QSOs at times become lengthy with others joining. I feel the following needs to be considered by all:

1 Where does another local station call CQ on SSB if 144.100 is occupied?
2 If there are horizontally polarised stations working on 144.100 and a mobile or vertically polarised station not hearing them calls CQ, what does a station do who can hear them all, but wishes to monitor for DX?
3 Are those working on 144.100 aware of whether there is a possibility of propagation at that time from ZL stations who call VK on this frequency?
4 Stations working on 144.100 can be a nuisance to stations 100 km or more away; eg stations working in Brisbane can interfere with stations on the Gold Coast, even if they are beaming south; and especially if the Gold Coast stations are listening for ZL.
5 There is less justification for working on the call frequency for lengthy periods than doing the same thing on repeaters.
8 If, despite the foregoing, it is deemed necessary or desirable at some time to be operating on 144.100, is a lengthy pause left by the station next in turn of value; better still, that station also calls QRZ with a further pause? (This allows both station's receivers to recover fully from the AGC).

"With the DX season nigh, I feel it might be time for a further 'plug' for the suggestion in January 1986 AR VHF notes, page 36, for all areas with an interested SSB group to all adopt 144.125 MHz as a local natter frequency, far enough from 144.100 to avoid splatter to and from nearby locals wishing to call/listen on 144.100. This would give everyone two frequencies to monitor for activity. If all on 144.125 MHz were enjoined to adopt procedures in six above, the occasional ZL, VK6 or VK8 breaker might find them, if these rare birds had no luck calling on 144.100 MHz!

"PS — 13/9, Saturday am, good conditions on two metres to VK2ZAB, also managed 4x1 contact on 70 cm, the first confirmed for some time. Gordon had only been able to erect one of his proposed four antennas for that band."

Thanks for the letter and your thoughts once more for the use of 144.100. As I said previously, there can be nothing wrong with the additional call frequency of 144.125 and I would certainly urge those operating on the band to try and remember to implement the idea, even if you only move there after starting on 144.100, that will be some help. Eventually, it might be accepted Australia-wide for local contacts in the main or at least a second chance for the DX station.

MOUNT GAMBIER BEACON

The SERG Newsletter from Mount Gambier carries a paragraph in the President's Report (Trevor VK5NC), to the effect that recently VK5RSE has had a coaxial change to the antenna system and a tune up. Trevor reports being advised of improved reception from listeners. I must say, the beacon has become more audible of late at the VK5LP establishment, but still not as good as it was before the water got into the original equipment. Trevor is suggesting an even better antenna system would help. Certainly if it can be returned to the situation where it is always there, even though weak, it will serve a purpose, now I find it is inaudible for 30 percent of the time.

OVERSEAS

Bill Tynan W3XO, of *The World Above 50 MHz* in October *QST* reports that the hoped for outstanding conditions which we enjoyed here in Australia last summer really did not eventuate in the same way in the Northern Hemisphere. Not that their Es season has been that poor, but neither could it be considered "one of the best!" They had the usual periods of ups and downs, culminating in a big opening on six and two metres on 10/5 and then seemed to trail off for a couple of weeks after their Six- Metre Sprint on 17/5. Substantial openings then occurred on 10/6 and 11/6, and these reached to 144 MHz. However, during their June VHF QSO Party, considerable excitement was aroused by the appearance of stations such as VP2MO, 8P6LL, 8P6JW, PJ2DEW, YV4UY, HC1BI as well as several KP4s and KP2s. Even OX3LX was worked by about 20 east coast stations. Nevertheless, the enormous Es conditions which we enjoyed over the greater part of Australia during the last week of December 1985, producing so many two metre contacts, certainly did not materialise in the US, so it will be very interesting to see if we are to be treated to a repeat performance this month.

With the increase in activity on six metres from England, trans-Atlantic contacts are becoming more plentiful. On 9/7 from 2232 to 2310, N4VA, who was camped-out on North Carolina's Outer Bank, worked seven Gs and one EI, with signals to S5. On 12/7 from Cape Cod, W2CAP/1 several; WA1OUB worked 22 Gs and K1JRW worked 15; on 25/7 HI8DAF was in for several hours, also the FY7THF and 6Y5RC beacons.

Still sounds like quite a good season to me, apparently there are plenty of six metre stations still around after the peak period of 1979-82, which augurs well for the future as they will probably be there in a few years when the next cycle should peak and we will be looking for F2 propagation again.

THE ROSS HULL CONTEST

I had a State Visit from Peter VK8ZLX, recently. He was on his way home after a visit to the eastern states during which trip he took around some suggestions I had noted down for the time when I visited Alice Springs, in regard to the Ross Hull Contest rules.

Apparently, the reception was rather cool in some places but at least they were something for the Contest Manager to think about and hopefully stimulate some more interest in the Contest. As these notes are being prepared ahead of the November issue of *Amateur Radio*, I am not aware of what rules may have been changed but in any case, I intend supporting the Contest as much as possible and I hope many others will do the same, especially to the point of sending in a log — that is very important!

As I said last month, my wife sees no need to accompany me for the period of my proposed portable operation from 26/12 to 1/1/87 inclusive, preferring to swat the flies from the comfort of the house rather than a caravan or tent in the summer! The operation will take place from Meningie, where I went last year, and will be on 52, 144 and 432 MHz. If the points scores for this year's Ross Hull give some advantage to long distance contacts, then the weaker signals often encountered from them will be worth pursuing.

GENERAL NEWS

Sometimes it is interesting to note the comments of six metre operators from other areas and here I refer to August 1986 *The Short Wave Magazine*, per favour of Steve VK5AIM: "Some observations of Ted Collins G4UPS, based on his long experience operating from Ascension Island as ZD8TC. He advocates the use of vertical antennas with a few radials for reception since much of the fading on six metres is simply due to polarisation changes, hence switching between the mandatory horizontal antenna for the transmitter and a vertical will iron-out this effect. He feels a two element Yagi is sufficient as longer ones with more elements tend to be too sharp 'for the inquisitive operator.' He is getting good results from his HQ-1 Minibeam."

The only comment I would like to make is that, a small antenna would be okay for run-of-the-mill Es to 1600 km, etc, but will miss out on really long haul contacts as we get occasionally here; eg double and triple hop and F2. With my eight-over-eight I do not seem to have much trouble getting people to answer my calls from ZL, FK and others!

Six metres has started to open up at various times, mainly to VK2 and VK4. On 10/10 I had a nice contact from 0810 with Lyn VK4ALM, at Rockhampton, with 5x9 signals. Lyn reported Mary VK4PZ, had worked Neil VK8ZCU, on 8/10 at 0330, also with 5x9 signals.

As this is the Christmas issue, I once again take this opportunity of saying "best wishes for Christmas and a happy year ahead" to all my readers. I thank those good people who write to me throughout the year setting out their experiences on VHF — without such continuing support the column would become very dull and I am indeed grateful. I thank the Editor of AR for his continuing support of my column and Bett and Ken McLachlan for their encouraging little memos which regularly turn up. Also, thanks to those who telephone information to me, it all helps.

With this issue, I commence my 18th year of writing these columns and there have certainly been many changes in the VHF/UHF world during that time. If I can last 20 years, perhaps I should prepare a summary of happenings over that time. *Interested?*

Closing with two more thoughts for the month: *Money does not talk these days — It just goes without saying* and *Many a live wire would be a dead one except for his connections.*

—73 The Voice in the Hills.

ATN HELPS SALVADORAN QUAKE

The Australian Traffic Net handled several hundred messages to El Salvador, in central America, after a 15 second earthquake hit on Friday, October 10.

ATN operator, Ken Richards VK3CKK, said there was a steady flow of third party traffic messages seeking information on the health and welfare of people in the disaster area.

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

Well, another year has gone by very rapidly and the solar cycle should start to improve from now on. Perhaps Father Christmas cleaning the chimneys during his trip from the North Pole may have something to do with it.

The variance in the economics have made many astute people wary of how they will spend their hard-earned money and deposits in the bank, but equipment has reached an all-time high in sophistication and value. Build or buy, this is the question?

It is possible to build if one obtains all the parts before commencing, otherwise a project could be left on the shelf for a considerable period before completion, due to one or two components being out of stock and the necessity of awaiting a shipment from overseas. Then again, it may never be completed if the component is discontinued.

One will never be able to copy the sophistication of commercial equipment with home-brew, in volume of the project or performance, and the parts are generally dearer than the commercial unit, so it is a matter of choice. The excitement and satisfaction of building one's own equipment, apart from the frustration of getting it working, (which is part of the fun), cannot be described.

Happy Christmas and health and prosperity to one and all for 1987. Particular thanks are extended to all the contributors, who have made this column as comprehensive as it has been over the year and your participation will be appreciated by all readers again next year.

Next month we will look at how an amateur with extensive experience has viewed the hobby over the years. From playing records in the early pre-war days to being a first class net controller during the last decade. No clues, but many VKs will guess who the guest writer is, and will enjoy his experiences which span in excess of half a century.

DXCC FRESH-START UPDATE

Following my comments in previous columns, I wrote to John W4FRU, voicing my opinion and some comments I had received. Following is a News Release, written by John, Chairman of DXAC, which accompanied his reply to my letter.

NEWS RELEASE

"What is wrong with the DXCC? If what we hear is correct, the DXCC has changed from a gentleman's club to a club in which there is little or no trust. Gone are the days of Gus Browning's escapades and with them, an era of trust and good fellowship within the DX community. Enter Don Miller and we have had almost two decades of red tape, some questionable judgments in applying the DXCC rules and often, an unrealistic view of how the rest of the world should conduct its amateur radio affairs. Somewhere between the present and the past, there must be a middle ground that will yield the sort of DXCC program which will be fair to all and yet remain a test of one's skills and fortitude in the DX world.

"The DXCC is not a basket case and I wish to allay fears that the DXAC is committed to scraping the present program or, that it has an objective slanted towards a "fresh start." That option is just one of many which must be considered and is perhaps the one least likely to be proposed. The DXAC is committed to recommending changes to those parts of the rules which are the sources of most of the grievances with the DXCC program. Specifically, the country criteria is overdue for an update to reconcile the piece meal changes which have accrued over the years and to present it in language which is understandable to all amateurs; accreditation has and will remain a sticky issue until some realistic ground rules are established which recognise that all countries do not conduct their amateur radio affairs in the image of the USA. The DXAC has three subcommittees dedicated to studying these and other areas of the DXCC rules. Your inputs are essential. To date, some of you have recommended "gimmicks" which would diminish the difficulty of the awards program. If this is what the membership wants, let your voices be heard. In the meantime, the DXAC will proceed on the premise that the honour roll is not to be an "instant jackpot," but is reserved for those who have taken advantage of all DX opportunities to catch a new one. Whether it takes a year, five years, or a life time to reach the top of the awards program, is really not a consideration at this time.

"Paraphasing an overseas DXer's comment on our study: "The DXCC is recognised around the world as a prestigious club and its awards program is the criteria for all countries." We intend to keep it that way.

"The DXAC solicits your comments. Put them in writing — ARRL, Attn: DXAC, 225 Main Street, Newington, CT 06111."

John H Parrot Jnr W5FRU
Chairman, DXAC

TRAVELLING

The "Globetrotting" Colvins are planning another trip to Africa in the near future, for a duration of six months. One of their main objectives will be to try and operate from Malawi. Unfortunately, Mozambique was a very decisive "No-No" however, Reunion Island is an affirmative using the calls FR7/W6QL and FR7/W6KG. All DXers hope that the authorisations applied for come to fruition. Good luck Iris and Lloyd. All QSLs via YASME.

Another DXer, who is Africa-bound, is George Collins VE3FXT. George was due to commence a five months stint early last month after a trip to Jersey and Guernsey, where he used the calls GJ3WNE and GU3WNE respectively. He hoped to visit ZS3, ZS, A2, 7P, H5, 3D6, and V9. The visits are not necessarily in the order given, but George has been known to "pop-up" from some unusual places and at some unusual times! QSLs to George via VE3DPB, PO Box 137, Lynden, Ont. L0R 1T0. Canada.

BURMA

Burma, a densely populated country, even though its natural resources are immense, is unfortunately one of the poorest countries in the world. The hobby of amateur radio is lower than last on a list of priorities, if that is possible. The government have written to the IARU on numerous occasions, stating that the hobby is not tolerated for the present. Nevertheless, several Texas stations report working XZ2A, firstly on SSB and later on CW, in the 15 metre band.

Beam headings were correct and, at the time, the band was open to JA. The "operator" said to QSL to PO Box 1214, Rangoon, Burma.

It may be another *work first and worry later* situation or a complete hoax. Even if the operator is actually within the boundaries of the country, has he or can he obtain the certification that is acceptable to Don Search at the ARRL DXCC Desk. I am afraid it is another "ulcer" and more gray hairs for Don if claims are made by the stations XZ2A worked.

COMORO ISLANDS

Bill D68WB, and his wife Laura, are medical volunteers who have lived on the island for approximately seven years. Bill was born in Kenya, where his parents were associated with the African Inland Mission.

Doctor Bill, (as he is often called), and Laura, are still associated with the Mission although they work as professionals in a Moslem country with about 10 other westerners. Laura and Bill, a surgeon, look after a 50 bed hospital on the island of Grande Comore.

Prior to being in the Comoros they spent 11 years in Tanzania and 18 years in Kenya.

GORGONA ISLAND

Did you work Gorgona Island? Gorgona was a penal colony until 1985 and is locally known as *Devil's Island* by the prisoners. It was actuated under the call 5J0FRC, by the Federated Radio Clubs of Colombia, and was due to activated again during October.

If you contacted them on three bands you are entitled to a booklet about the Island. QSL to PO Box 050177, Medellin, Colombia. or PO Box 1767, Bogata, Colombia.

Other operations are planned for the future is you missed this one!

DO NOT QSL VIA JARL

QSLs to JJ1TZK, for various operations in the Pacific, will not reach him if sent via the bureau. He is not a member and, it is believed, they will be destroyed. Either send direct or save your cards.

REVILLA GIGEDO

Apparently an operation from XF4 is planned for March, next year, with an impressive list of operators. Quite a number of VKs require this one.

MONACO

I am not attempting to go into the award columnist's department, but those who have worked, or heard (two-way) three resident stations of Monaco since 1980 are eligible for an award.

Send details or a photocopy of three cards, not bearing the 3A0 or /3A prefix, or a signed statement by the national awards manager stating that he has sighted the cards, to 3A2LF Include 10 IRCs or US$6. It is a worthy and attractive award and well worth the outlay for award hunters.

DX IN THE DOLDRUMS

No! One should have listened to 10 metres on September 28, around 1400 UTC. For a short time, Europeans were S9+ and from many different call areas. Were you lucky as I did not hear a VK being worked?

It pays to monitor all bands as the conditions are quite strange at the moment. It could be a good sign that the Solar Cycle is on an upward trend! Let us hope so as the "cupboard" has been slightly bare.

ANTARCTICA

A new group are due to exchange duties with the present crew in the near future. Call signs and names are unavailable at the time of preparing these notes but be listening on the bands for new VK0 calls emanating from the "Cold South." They are generally below 14.175 MHz and on other bands as conditions and work duties permit.

ABOUT FACE

Can you imagine the Falkland Islands rotating 180 degrees? No! It is not an April Fool Joke, but fact.

According to research at England's Oxford University, they have found that the Islands have done a complete half-turn over the last two-hundred-million years. Apparently it is a well-known phenomenon and even Australia is heading towards Asia. There is no need to panic as it is only a few centimetres per year — but it is occurring.

Evidently, at one time in history, India crashed into Asia and the land buckled, causing the highest mountain range on the Earth's surface, the Himalayas. India is still travelling northward, virtually burrowing under the area and, since the early settlement of man, it is estimated that the range, seldom conquered by man, has risen some 1500 metres!

So, when next you talk to someone on the west coast of the Falklands, think that the land where the QTH is now, was on the east side of the Island at one time!

YEMEN — MAYBE

It appears that plans are afoot to activate 4W. However, the unknowns are when? what call sign? and whether the correct documentation, acceptable to the ARRL, will be available?

According to Bob Winn W5KNE, Editor of *QRZ DX*, commercial communications equipment is

scheduled to be installed in Yemen and, at this juncture, the successful tenderer for the work is sending a technician to Yemen. Apparently, this technician has an amateur licence in his home country. Late news was that the operator was American and was due to leave for Yemen on October 8. The operator cautioned he would be very QRV with his business tasks for the first couple of weeks, at least.

The technician is confident of getting approval and, if so, will probably work 20 metres SSB on a split basis, having selected the frequencies of 14.183, 14.195 and 14.226 MHz.

It is a case of "wait and see." Unfortunately, due to the lead time of writing for publication, by the time you read this it may all be history or it may not have even commenced!

CHRISTMAS ISLAND — VK9XI

Ron ZL1AMO, was active from Christmas Island in late-September. As VK9XI is a club station, it would be prudent to OSL to ZL1AMO, either direct or via the bureau. There is going to be much confusion as to whether it was Ron's operation or the Club's, particularly by overseas stations who need this area. I wish the Federal QSL Manager, Neil VK6NE, the best of luck.

PITCAIRN ISLAND

Seems Pitcairn will have another amateur soon! Meralda Warren, sat for the examinations recently and is now awaiting a licence.

Congratulations Meralda, and that you are heard on the bands very soon.

Pitcairn Island is becoming quite amateur populated and could have the highest percentage of amateurs per resident-population in the world.

Meralda kindly sent me a book on Pitcairn which gives the history of the Island and a number of interesting facts about the area. It is an excellently produced edition, complete with colour cover, and would be a worthwhile addition to the library of anyone interested in the Island. Those interested in obtaining a copy may find out further details by writing to Meralda. Allow adequate time for the mail to be received and answered as the shipping traffic is infrequent.

TRACTOR MOBILE

Anyone hearing a station signing VK4FUE/TM would be curious. It has happened. It is a new one to me although I have worked /EM (Equestrian Mobile); /PM (Pedestrian Mobile); /TM (Train Mobile); over the years.

VK4FUE is in the sugar-cane area of Queensland and, as he is harvesting, operates /TM. Perhaps OM, you may care to forward a photograph and story for the magazine — it would be of interest to all, I am sure.

SICK LIST

Three well-known DXers have, unfortunately, been hospitalised over the last few months. Arthur VK3UX, John VK3JF and Col VK3WQ, have had their spell of being cared for by the nursing staff of three major Melbourne hospitals. All DXers wish this trio well and a speedy recovery.

GOUGH ISLAND

Two operators! Wow, how about that! Well, it is not as good as it sounds because ZD9CL (QSL via ZS6AEN) was only active for eight weeks. But, don't despair as ZD6CK will be operational for two years. Good luck and if in doubt, follow the ANZA Net, capably MCed by Percy VK3PC, for updates on this rare location. The Net is on both 15 and 20 metres, as conditions permit. Newcomers are more than welcomed by Percy.

NO TIME, BUT STILL OPERATES

A note from Joy VK2EBX, intimates that she has little time to operate, but she picked up a few nice ones over the last few weeks.

One was GB6OC, operational as a special events station from Ashton University, Birmingham.

On 20 metres, the outstanding ones have been KB6CLL, KL7JA and AH9AC, with quite a few Pacific Island licensees and a few Ws.

It was also lucrative on 40 metres with stations such as 5W1FT, ZL7AA, GB2BJK, and others with weak, but readable signals.

Joy has received a note from Don G3NOF, of the Yeovil Amateur Radio Club, in Somerset (Joy's QTH is Yeoval). Don, noted that the call GB4OYC was used from October 16-19, to celebrate 40 years of operation.

This club has really got amongst the special calls as, in mid-August they operated as GB2YFT (Yeovil Festival of Transport) and GB2MSS (Mid-Somerset Show). The United Kingdom is really allocating a number of special once-off call signs of late, and it is a pity that VKs are not taking advantage of the propagation, combined with patience and tenacity, to pick them up.

Don was awarded the *Royal Order of Trans-Atlantic Brass Pounders* for 1986/1986, from the RSGB, with the noted commendation of "for outstanding and consistent DX performance." Congratulations from all DXers, Don.

Ladies and gentlemen, DXing is an art wrought with frustration, perseverance and time. Are you a DXer or a listener who is very choosy for 5x9 stations, not in a pile-up?

LISTEN

TP2CE, is hoping to actuate this call from 5-7th, this month.

HEARD ISLAND

VK0 Heard Island could be heard shortly, if a party was successful landing from the *Nella Dan*, last month. As there is apparently a lot of work to be done, operation could be infrequent, but it is believed one of the Meteorological Department Observers has an amateur licence. Operation therefore, would only be in off duty hours!

It appears that the working-party will leave the island about the middle of January 1986, weather permitting, on the *Icebird* which will be en route to the other Antarctic bases to effect crew changeovers and reliefs.

If you have it confirmed, please refrain from being in the log and allow others to have this much needed country confirmed.

NEW CALL

Noel 8Q7AV, is presently using the call sign, 4S7AVR. Noel is an airline captain and the airways of 4S7 are not new to him. His present QSL address is 15/2 Balahenmulla Lane, Colombo 6, Sri Lanka.

YI1BGD

A number of operators use the call and generally give their own box number for QSLs. If you miss it, do not despair and QSL to the Scientific Centre, PO Box 5864, Baghdad. The cards, which are beautifully produced, were donated by the Family DX Foundation. Remember IRCs, that have been issued within the last two years are only acceptable by the postal authorities in this country.

KERMADEC ISLANDS

Listen for Peter ZL8HV, from this area on the HF bands. Peter hopes to be active as work duties permit. Remember, if he says he is going to have a meal, he means just that. Otherwise, if he is late, he will be a very hungry lad. This is typical of station operators from Meteorological and Antarctic stations. Generally, they do not run a continuous canteen, unfortunately.

SOUTH SHETLANDS

Apparently, the Uruguay DX Club hopes to actuate the South Shetland area early next year. Ricardo CX2CS, is very keen and CX0XY, should be already quite active with a reasonable amount of RF going up the coax. Listen out!

THE BANDS ARE NOT DEAD

Jim VK3YJ, the Australian columnist for *73* magazine, still maintains that one can work DXCC in a month. Jim has worked:

1Z9B, 3B8DL, 3D2MR, 4S7NMR, 4Z4VG, 5B4TI, 5B4UN, 5N9GM, 5W1AU, 5W1FT, 6K86AG, 6Y5NR, 7J1ACH, 7X2DX, 8P6OV, 8P6PT, 9H1EU, 9M8GH, 9V1TL, FK25FU, G3EDM, HL1APR, IT9WVL, J37AH, JM1WII/KH2, KH6GS, KL7J, KX6AO, S83H, T30AT, TR8SA, TI2ANL, T32BC, V2AU, V85DU, VE7YL, YO1BGD, and ZL7AA, to name but a few.

Congratulations Jim, firstly on your column, which is read world-wide because of its excellent standard in giving news about Australia, and secondly on the time you find to work the rare ones, considering your other commitments.

QSLs AND ALL THAT

I had second thoughts about publishing the call signs that Joy VK2EBX, had not received cards from, as it was not my intention to embarrass anyone. I am now glad I did as I have found some of Joy's missing cards and probably a few more for others.

A note from Sam VK2AKP, (also 9H1GS and ZB1GS), enlightens the situation. Sam notes: "I occasionally read about amateurs sending cards via the bureau and receiving no answers. One thing to remember is that not all amateurs belong to their society, hence they have no access to receiving their cards. It would therefore be prudent to ask an operator if he is okay for cards by this method.

"Another item to remember is that it takes sometimes years before the cards reach the member and then one has to wait his/her reply.

"Joy complained about Tony 9H1EU. Tony is a very keen amateur, but unfortunately he is not a member of any bureau, so the chances of him receiving Joy's card is very small and if he does, how is he going to QSL?"

Sam has, or can obtain, cards from most 9H1 and 9H4 operators and is willing to assist, either by a SASE to QTHR or by contacting him on the *Land Forces Amateur Radio Group Net*, 3.595 MHz each Wednesday.

Henceforth, Joy, who Sam has cards for, and others will get their cards in the near future. Thanks Sam, for your insight into the system and your assistance.

BITS AND PIECES

TA1A advises that IRCs are not acceptable in Turkey! ! ** Do not forget the best photograph of your shack and a little about yourself for next year's issues of *Amateur Radio* and a chance to win that **SWR Bridge** kindly donated by **GFS Electronics**. ** **J40MAR** was **Rudi DJ5RT** operating from (SV5) **Kos Island**. "MAR" stands for **Medical Assistance Radio**. ** **VE0MAB** was operational MM from a Coastline Vessel and does not count as a DXCC country. ** **Krishna** signing from Nepal, is a rapid QSLer. Apparently, he is running a 751 to a tribander and is the only one keeping Father Moran company on the bands in this vastly populated country, where the hobby has not really been recognised as yet. ** **Frank ZF1GC** is the only station operational on packet radio from the **Cayman Island Group**. QSL to **VE4XN**. ** **Mount Athos** operations still in the air. WHY? is the big question. Is it more than the documentation? ** **ON7IP/ST2** was due to go QRT at the end of last month. ** Many countries are getting organised on the **WARC Bands**. Although other Regions only encourage CW and Narrow Band modes, have you heard or worked them? ** Amateur radio could unfortunately be a "No-No" again in **Uganda**. ** 3G9 no — it is not a typographical error. The call sign **3G9SBY** will be heard from **Yelco** located in the Antarctica from December 5 for five weeks. The operators are **CEs** who promise modes such as **CW/SSB/RTTY** and **AMTOR** on all bands from 160 metres through to 10. ** **Trindade Island** had its share of operators in October. Hope that the large number of VKs in need of this area for a "new one" made it. ** **Luiz S92LB** is still active spasmodically but is very quick on returning cards is your are lucky enough to make a contact. ** **Kimsan** signing as **XU1SS** has been reasonably active again, generally 1300-1400 UTC. ** **CV1R** was activated by the **Radio Club de Maldonaldo** and located on the **Isla de Lobos**. ** **EF6RCD** was a special call used to activate **Formenera Island**. The station used one kilowatt on all bands. QSL to **EA5OZ**. ** **Calvin VQ9QA** is active until mid-March, with hopes of operation on 160 metres. ** **Akito JA5DQH** will sign NN7S until December 5, after hoping to sign as XX9XX at the end of November. QSL to **JA5DQH**. ** **USSR** amateurs gained access to the use of 10 MHz as from October.

CLOSURE

A Happy Christmas to all and the best in health and happiness for 1987, from this QTH to yours. Do not eat too much Christmas Pudding and the trimmings, as the *Ross Hull Contest* needs your support. And most importantly, do not forget to send in your log!

The deadline of these notes for the February edition is December 29. In other words, there is no rest for a columnist to make his errors, and please do not forget the Best Looking Shack Competition, commencing next month.

In closing, a couple of "gems" from Lee KH6BZF, Editor of the weekly propagation publication *KH6BZF Reports*. ". . . when you retire you are in control of one of the most powerful work tools — ***tomorrow***! ! !" and ". . . you know you are getting older if you run into a girl you once knew and it is her daughter! ! !

THANKS

Sincere thanks since I have been writing this column, and particularly over the last year, to the editors of weekly, bi-weekly and monthly publications such as: *ARRL Newsletter; BARG; CQ-QSO; The DX Family Foundation Newsletter; Inside DX, The W6GO/K6HHD OSL Manager List* (a must for all DXers); *KH6BZF Reports* (for those interested in propagation and hilarious quips, not to be missed); *Long Island DX Bulletin; Papakura Radio Club Bulletin* (which has an editor with a sense of humour); *ORZ DX* (with Bob W5KNE, a tireless editor who never seems to rest); *RSGB DX News* (a valuable publication); and the *Westlakes Amateur Radio Club Newsletter.*

Magazines including *Break In; cqDX; DX Post; JA CQ; JARL News; KARL News; QST; Police Life; RadCom; Veron; Weather News* and *Worldradio*, to mention but a few.

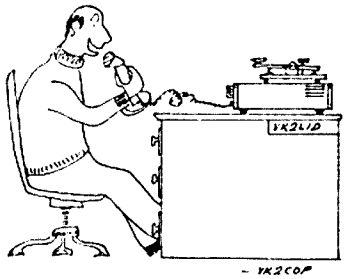
Individual contributors this month include JH1KRC; JP1LAB; W4FRU, WB6GFJ; VKs 2AKP, EBX; 3PA, XV, YJ, YL; 6NE; ZL1s AMN and AMM and Christa Stueckle.

To all contributors, your assistance, advice and information has been greatly appreciated and invaluable. Sincere thanks to one and all and let us hope 1987 is a year of health, peace, prosperity and plenty of the DX we all need.

—73, Ken VK3AH

"Bought an absolute bargain at the Field Day OM — although I haven't found out what it is yet?"

—VK2COP



HISTORICALLY SPEAKING

Following is a portion of a dossier, containing hundreds of newspaper clippings, compiled by George Palmer VK4ZG and contributed by Jim Davis VK7OW. Jim is a historian of some note and has the original Carbon Reisz microphone used by Broadcast Station 7UV, in his microphone museum. He also has a private cinema with many restored cinema projectors, a complete 1927 "Talkie" system and Disc No 7 which was played in conjunction with reel one of the Warner Brothers 1927 movie, "The Jazz Singer."

George Palmer, was the founder of Broadcast Station 3AK in Melbourne, and in 1933, he bought 7UV Ulverstone, Tasmania.

At the age of 17, George was the youngest film producer in the world. In 1927, he made the film *The Northbound Limited*, an express train drama in which he performed all the stunt work.

In early 1935, the PMG's Department approved a substantial power increase for 3AK. As a result of this power increase it was necessary to build new equipment so the station could serve the Victorian listeners in the same efficient manner as other Melbourne B class stations. The wavelength of 200 metres however, remained unaltered. The station was located at 116 Queen Street, Melbourne, and was in its fourth year of operation.

During the early years of radio, when amateurs were allowed to transmit music on the lower end of the broadcast band, some difficulties were encountered by the amateurs and broadcast stations.

From Broadcasting Business, March 8, 1935:

"Following an alleged statement of Mr Brown, Director of Postal Services, and published in the Melbourne 'Sun-Pictorial' on Saturday, 23rd February, there has been some discussion in Melbourne broadcasting circles as to what constitutes a 'B' station.

"The 'Sun's' paragraph read as follows: 'So as not to interfere with station 3AK, three or four amateur broadcasters in Balwyn district have been told by the Postal Department to remain off the air, said the Postal Director (Mr Brown) yesterday.

" 'There is no general exclusion of amateurs. Station 3AK, while not a recognised 'B' class station, broadcasts regularly late at night and at certain hours on Sunday.

"The words 'Station 3AK while not a recognised B station caused us to investigate the position and the following statement was made by Mr C F Palmer, Managing Director of 3AK.

"The statement in the 'Sun' that 3AK is not a recognised B class station is a most unwarranted and harmful one. 3AK is licenced as a B class station by the PMG's Department and is now in its fourth year of service, paying from its very inception in 1931 the same licence fee as other B class stations. It also operates on its own wavelength independent of all other Melbourne stations, and the only distinction between the other stations in that its authorised hours of service are restricted.

"Mr Brown's remarks that certain amateurs in the Balwyn district must remain off the air so as to avoid interference with 3AK also conveys another wrong impression, as there are still certain times when experimental stations in this district and elsewhere could continue, so why penalise three or four amateurs when all that is necessary is a simple re-arrangement of their schedules?

"Inquiries at the Postmaster-General's Department failed to determine whether the Department considered whether 3AK was a recognised B station or not.

"The fact of the matter is that there are no B stations and on that score the statement is loose. There are three divisions of Australian broadcasting stations: the National stations, the licenced stations and the amateurs.

"3AK is most decidedly not a National station and, considering that it pays the same licence fee as the other licenced stations, it may safely claim to be a recognised licenced station.

"Owing to its looseness, a misconception about 3AK can be caused and it is rather surprising to see such a statement allegedly emanating from the PMG's Department. If, on the other hand, such a reference was not made by the PMG, then it is loose and harmful reporting."

The amateur stations affected in the above were 3BT, 3OY, 3OV, 3TM, 3KE, 3XL and 3CR.

No doubt the matter was eventually resolved amicably between all parties.

On April 20, 1935, 3AK operated from 12.30 pm to 2.30 pm, then from 10.00 pm to 12.00 midnight.

—Information compiled from the following 1935 newsclippings: THE AGE, Melbourne, BROADCASTING BUSINESS, Sydney; LISTENER IN, Melbourne; AMATEUR RADIO, Melbourne; WIRELESS WEEKLY, Sydney

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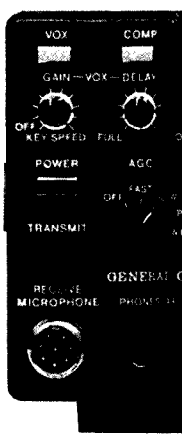

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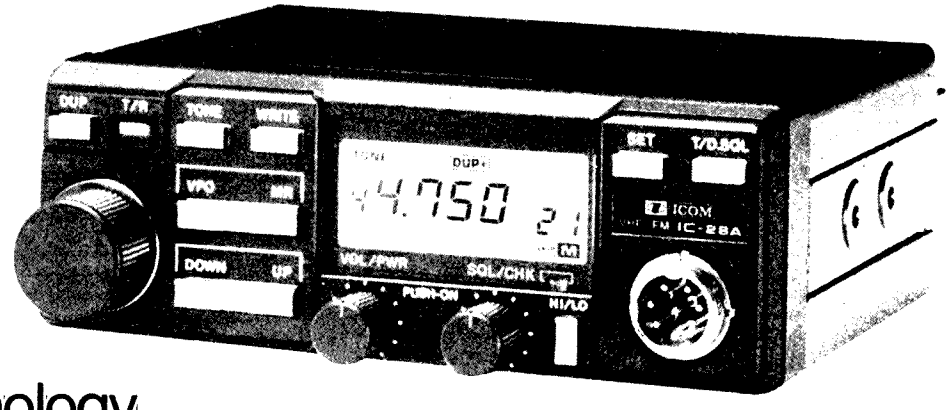

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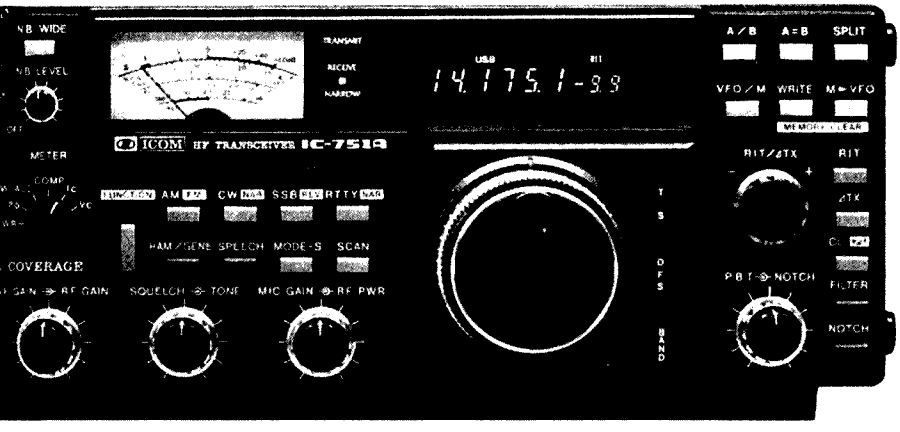

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Directors	Parasitic (Dipole Type)
Input Impedance	50 Ohms
VSWR	≤ 1.3/1
Max.Power	100 Watts
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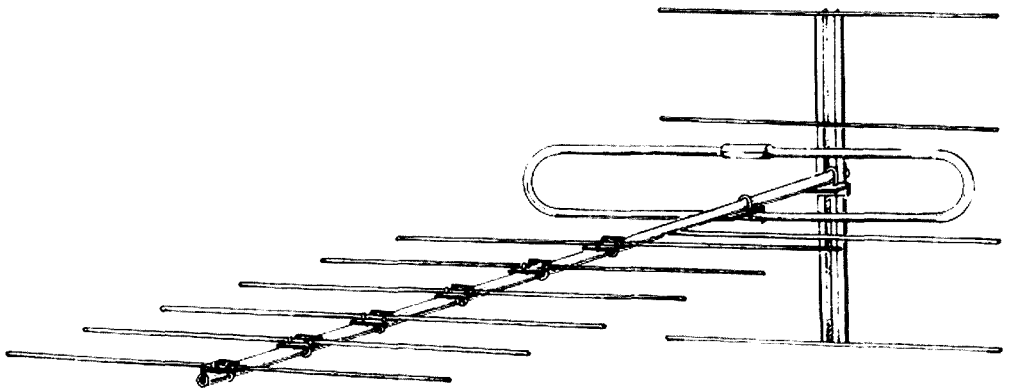
Bandwidth	10 MHz at ≤ 2/1
Gain over 1/2Wave Dipole	13.6 dB Measured
Front to Back at Centre Frequency	Greater than 35 dB Measured
Side Rejection at Centre Frequency	Greater than 65 dB Measured
1/2 Power Beam Width	E plane = 17° H plane = 23°
Connection	Approx 2Mtrs RG213 Coax Cable, Terminated with a 'N' type female plug.
Wind Tolerance	160 KM/H (100 MPH)
Boom & Element Construction	6063 Aluminium Alloy.



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CONTEST CALENDAR

DECEMBER

5- 7	ARRL 160 metre CW Contest (Rules this issue)
13-14	ARRL 10 metre Contest (Rules this issue)
-13	Ross Hull Memorial VHF Contest commences (Rules November issue)

JANUARY

- 1	UBA SWL Competition (Continues to December 31, 1987)
- 5	Ross Hull Memorial VHF Contest concludes
23-25	CQ WW 160 metre CW Contest
31-	YL ISSB CW Contest

FEBRUARY

- 1	YL ISSB CW Contest (concludes)
7- 8	QCWA CW QSO Party
14-16	YLRL YL-OM Phone Contest
20-22	CQ WW 160 metre SSB Contest
21-22	ARRL DX CW Contest
21-22	YL ISSB Phone Contest
28-	YLRL YL-OM CW Contest

MARCH

- 2	YLRL YL-OM CW Contest
7- 8	ARRL DX Phone Contest
7- 8	QCWA Phone QSO Party
14-15	John Moyle Memorial Field Day Contest
28-29	CQ WW WPX SSB Contest

There certainly seems to be plenty of action available to those interested in contesting during the next couple of months, be it either phone or CW, OM or YL operators. I trust that you will enjoy it!

Well, once again we come to the end of another year. The time certainly does seem to fly past. Looking back over the last 12 months, I find that generally I can feel satisfied that contesting in Australia has been on a fairly sound footing. As Federal Contest Manager I know that I cannot please everybody as far as rules go. I have, however, tried to bring about improvements in contests without doing so in a radical way. Change can, undoubtedly, be a very good thing at times. Change, just for the sake of change, is a pointless exercise. I feel that more can be done to improve contesting within our area of operations, as well as throughout the world of amateur radio in general. I will be making some recommendations to the next Federal Convention in 1987, as well as possibly leaving suggestions for my successor later in the coming year to think about. Meanwhile, I will watch with interest to see whether or not major changes will need to be made to the Ross Hull Contest format, whether we see an increase in CW operation in contests, whether more novices will begin to participate in contests. It will also be interesting to see how well the combining of our Field Day and Remembrance Day Contests with like events in New Zealand, will work out. Thus, I do look forward to the coming new year with anticipation as well as enthusiasm. Traditionally, at this time, we do contemplate the past and look forward to the future. I would wish for us all, that the future will be one of happiness and peace.

Just recently I attended a most moving presentation held at dawn in the parklands bordering the City of Adelaide. On a particularly beautiful and clear morning, a group of young women, all dressed in white, gathered there representing the *Rising Generation*. They had brought with them, written messages which were to be attached to gas filled balloons. These messages were about such things as peace and love. Certainly a very fitting approach with the International Year of Peace, which is fast coming to a close. The themes chosen were Faith, the Divine Nature of Mankind, Individual Worth, Knowledge, Choice and Accountability, Good Works and Integrity. Each of these subjects, I would, believe are such that our Amateur Radio Fraternity would wish to apply such principles in our activities. These young women were sending their messages attached to balloons in the hope that they would be found by someone and their messages read and understood. Likewise, we, as radio amateur operators send messages. We have the benefit that in an instant we usually know if someone has received our message.

I would like to think that as we send out messages in the new year and the years to come, we too might carefully consider our fellow man and try and make sure that our messages are ones which will be of help in building a better, happier, more peaceful and tolerant world. Goodness knows, we constantly claim the role of being International Ambassadors of Goodwill, so let us not just think of this only at Christmas time but rather make a firm determination to try to follow this idea at all times. Let this not be only on an International level either, but also apply it to our relationships with the amateur around the corner, our Divisional Council, club officers and members as well as our workmates, non-amateur friends and neighbours and particularly our families. I am sure that we can be a force for good in the world with our association with such a marvellous hobby as amateur radio.

I would like, at this special season of goodwill to express to all, wishes from both my wife Sylvia and myself for a very Happy and Blessed Christmas and for a Peaceful and Successful New Year.

—73 de Ian VK5QX

REMEMBRANCE DAY CONTEST — 1986
CONGRATULATIONS TO THE VK4 DIVISION

Below you will read the full results of the Annual Remembrance Day Contest for 1986. The VK4 Division, I am sure will be most pleased to receive the trophy at the 1987 Annual Federal Convention. The last time that Division won the contest was in 1971, so one can see that there has been quite a drought for VK4. It may interest you to know just how many times the trophy has been won by each Division. Here are the details:

VK1 — 2; VK2 — 3; VK3 — 1; VK4 — 4 (including 1986); VK5 — 14; VK6 — 8; VK7 — 7.

Here are a few more statistics regarding the 1986 contest.

DIV	No LOGS/No LICENSEES	ENTRIES PERCENT
	(Listed in order of participation percentage)	
VK1	55/302	18.2
VK6	120/1438	8.34
VK5	121/1774	6.82
VK7	33/5897	5.62
VK8	6/173	3.46
VK4	89/2619	3.40
VK2	133/4887	2.72
VK3	93/4559	2.03

Average Points per Log by Division (listed in order of average score)

VK5	15638/121	129.23
VK1	6324/55	114.98
VK7	3719/33	112.60
VK6	13400/120	111.66
VK3	10367/93	111.47
VK4	9788/89	109.97
VK2	13798/133	103.74
VK8	263/6	43.83

The formula for determining the winning Division in this contest has been changed a number of times as has been the method used for scoring contacts. I am quite convinced that simply scoring one point per contact is the right method and I can provide comment to support this premise, however, I am far from convinced that the method of derivation of the formula determining the final result is what is really required. In a later issue, I will provide more comment on this subject with a view to stimulating discussion at the next Federal Convention. Meanwhile, it is good to see the trophy begin to change hands on a more frequent basis.

Amongst the individual results of the Remembrance Day Contest, you may note the entry from M Rayner in the SWL Section — VHF This was really an effort worth commenting on. Matthew is located in the Canberra area. To log the total number of 804 contacts on VHF from that location is certainly a terrific effort, and I note from Matthew's log that, on quite a few occasions, he was logging at a rate of up to five contacts per minute. I know, as a fairly experienced contest operator, that it does require quite a deal of concentration to maintain a contact rate of four per minute and upwards. I imagine that when Matthew obtains his call sign and comes on the air as a contester on the transmitting side of things, he will probably give quite a few of us a fair run for our money!

The standard of logs generally was fairly good, as referred to in my column in November, however, I would again plead with the minority of entrants to please read the rules for contests thoroughly before submitting logs. Different categories/sections etc, in most contests, usually mean separate log entries, and by separate I mean — *totally separate* logs, declarations, and summary sheets are required.

Two logs were received well after the due date. One from VK6 had been mailed Express Courier on September 25 (closing date September 26). Australia Post, in a valiant effort to ensure that the posted article was delivered in accordance with the best traditions, had attempted to deliver the package to the WIA rooms at the Thebarton Council area. These rooms are only attended when meetings take place at the Divisional Headquarters. Australia Post had taken this action, I am sure, in good faith rather than just deposit the package in a post office box. This is the second occurrence of this nature to my knowledge in close to three years. The message is *Do not send your log so late that it needs extreme action for it to arrive on time. Do not use Express Courier unless you are sure that the item can be properly delivered in person.* One other log was sent to the Federal Office by a VK2 operator instead of being sent to the correct address for the FCM.

You may have been surprised to see the results of the contest published as early as December. There are at least four reasons for this. Firstly, I have had just a little more time available to carry out the log-checking, etc. Secondly, I felt that I really had to do something to make amends for somewhat of a mistake made last year under extreme pressure. (Recover my good name if any, so to speak).

Thirdly, I have now had somewhat more experience at handling the Remembrance Day Contest and thus was much better organised. Fourthly, and by no means of least importance, I had available to me an excellent computer facility to help in compilation and listing of the results. This latter aspect certainly made my task a great deal less onerous and accounts to a large degree for the speed in which the results can be produced. I still do not have my own computer and tend to feel that in contest logging, I would be slowed down somewhat by the use of a computer as against my manual logging and checking methods used while I operate. Even so, I hear others telling me that computer logging for contests make things so much easier, so I guess that eventually I will have to weaken and try it out in practice. (I find it hard to let go to a well tried and proven system though!).

Now for some comments from entrants in this year's contest.

How about a few words of gratitude for the assistance, or maybe tolerance, given by our wives, etc. Susan, my wife, ran the log on my Sanyo for all but two amateurs. I could not have been more grateful — VK1PJ.
(I concur heartily, Phil. However, I must do something to slow my wife down in bringing me drinks all the time. I then consume them and have to leave the transmitting location at more frequent intervals).

The operation standard of other stations in this years contest were very co-operative and pleasant — VK3BGS.

Sorry that I have not included a dupe sheet, however I have thoroughly checked the times. I will do better with the logs next year. . .a most enjoyable contest — VK1ZDX.

. . .had a memory chip failure which, in turn, damaged a data buffer chip. . .other than *Murphy* being about with hob-nailed boots, I enjoyed the contest — VK2BAM.

Thank you for the time and the effort you put in as the Contest Manager — VK3YH.
(You are welcome, Steve — FCM).

Met up with a number of regular RD Contest Operators; 5BI, 2APP, 5QX etc. I have never met them outside the RD Contest!. . .to me it's the fun of the fair digging the weak ones out of the QRM. Fortunately, there are many more gentlemen operators about, than the other kind. I'll be rendering a report again next year. But hope to 'work' for more that the paltry 10 hours I was able to operate for this year — VK4AEV.
(I do operate regularly on the bands every week. That way I keep my station in shape for contests — 5QX).

This is the last batch from me. I understand some people sent theirs in direct. I don't envy your currant task. 2 hours was just right — Christine VK8ZLZ.
(Christine collected as many as possible of the VK6 logs and sent them all along together with a neat listing of details of the logs. Thanks for your efforts Christine — FCM).

An excellent contest this year. The 2 hours between contacts on VHF was perfect over here in the west — had time to work some HF in amongst the VHF scrambling — VK6YS.

I do not have a VHF log again this year. The sole reason is that there was not enough interest in this area at the time. The rules for VHF this year I believe are appropriate and I suggest no change for next year — VK6DM.

This is the second year that the Northern Corridor Radio Group has competed in the RD Contest. 1006 was more enjoyable than 1985 (which was great) and here's hoping that 1987 will be better than 1986 — VK6AFK for the NCRG.

I generally enjoyed the contest although the propagations conditions on 10 and 15 made it more difficult for the novices. I was disappointed with the operating habits of some stations who started transmitting right over the top of me without asking if the frequency was clear. . .late Saturday and early Sunday was very different with everyone friendly and courteous — VK5NQP.

It would not be normal for me to omit any comments on the RD Contest. a) 2m FM Although activity was down it was at least orderly and the repeat time interval is good. b) By comparison 80m HF was the usual shambles — a problem we will always have. Although a nuisance to calculate and check, I liked the variable points system — VK5EA.

I seem to be scoring fewer and fewer QSOs as the years go by. Maybe it's coincidental with the sunspot cycle; maybe fewer and fewer CW ops contesting; maybe a bit of both! Or maybe I'd do better by improving on an 18AVT trap vertical antenna. Getting the ZLs Memorial Day to run in conjunction with the RD sounds like a great idea to me. At least we could expect more contestants. Something should be done to encourage more contestants since CW was the main mode of those we commemorate (I know, being fortunate enough to survive). I did suggest, a few years ago, that, on HF, the *minimum QSO number* could be made *compulsory CW QSOs* — VK2AOF
(Now, there is an interesting approach. Anyone else like to comment — FCM).

Once again we have had a most enjoyable RD Contest which was, if anything, more enjoyable than last year. The HF Section was difficult due to poor propagation. . .return to the rule which awarded higher points for more difficult contacts. . .If this griping sounds familiar, I have been making the same comment every year since 1981. *Please bring back the differential points!* Now that I have had my grumble I can thank you for a most enjoyable contest — VK6FC.

As a school radio club we found the Novice and RD Contests very worthwhile club activities. . .would really recommend contesting to other school radio clubs as a means of providing a focus to other activities — VK3CP for VK3IE.

Can't remember having heard as much action as there was this year. . .speaking of novices, there didn't appear to have been too many operating. . .would also like to see the WARC Bands encouraged in the contest. We are constantly being bombarded with the "Use them or lose them" philosophy. . .We did have one problem with the computer. Whenever we were transmitting on HF, the computer operator would have to keep his fingers at least 40 mm from the keyboard, otherwise the keyboard would send out spurious characters to the PC. Steve VK3DCA, suggested that I should earth myself, so I connected a wire to the SEC earth and put the other end in my mouth.
(Boy! This guy's either really game or nuts! — FCM).

No success. The second try was to wrap my fingers in aluminium foil. This fixed the problem but I couldn't type properly and the foil kept falling off. We ended up tapping the keys with a pen — VK3CRA for VK3SCD/R
(. . .and resourceful too! It is policy that the WARC Bands should not be used for contest purposes — FCM).

Operated QRP during the contest using a Heathkit HW8 transceiver with only 2.5 watts into the antenna and enjoyed the challenge very much. I must thank the operators who stood aside so I was able to make the contact even though it was their frequency. There are still a lot of gentlemen on the CW end of the band — VK4SF

. . .another fine event. I operated my own station (VK4BNL) from my home QTH and the Scout Association Station VK4SAA from Baden Powell Park. . .I found the courtesy on air at all times magnificent. . .we were delighted at VK4SAA for encouraging comments to us from time to time. . .Our main reason for putting VK4SAA on the air was not only our support for the contest itself, but also as a means of showing our appreciation of the WIA for their support shown us since the inception of JOTA. . .We hope to take part again in 1987 — VK4BNL.

Dear OM, my weekend was very well organised until Saturday evening when I thought I'd have a quick listen before retiring. Next year, I'll ensure that the fence demolition is on another weekend, and get someone to fill for me in the Church Choir — VK2AYO.

It was a nice coincidence to work you on each of the three bands which the club station worked. . .We enjoyed the contest very much — VK4AOR for VK4BTB.

Just a short note to say just how much we enjoyed the contest. Many thanks for running it. . .On VHF things were a little slow. . .on HF conditions were good and there were ample stations to work — VK3DBQ and VK3VOJ.

We would like to thank the WIA, through you, for having such a wonderful event — VK2AXS for VK2IYP/R VK2AUZ/P and VK2AXS/R

Good luck with your efforts and I hope you don't have too many late nights — WIA-L30371.

The novice holders seemed to be a bit thin this year and I did not work one on CW — VK2DQP.

I entered the sideband transmitting section of the contest, however I did work some stations on CW — VK5BWZ.

. . .enjoyed this contest and I think the two hours between VHF/UHF contacts is a far better idea than last year — VK8KCI.

I missed about an hour late on Sunday afternoon because the guys from Melbourne came down from the mountain where they had been installing the Porepunkah two metre repeater — VK3CGG.
(Where on earth is *Porepunkah*? — FCM).
(Near Bright, Victoria — Ed).

General politeness and friendliness high — VK5DJ.

A great contest — one of the best I've known for spirit, lack of sneris, etc over the last XX years. Well done for the clear rules, and may the best Division win — VK4AEM.
(Well Ted ! ! ! — FCM).

This is the first time I have taken part. . .I enjoyed the weekend and would expect to take part next year — VK2BMZ/R

Transmitter output was three watts on 80 metres and two watts on 40 metres — VK4CI.

One modern thing I don't like is the dropping of the RST report — VK2JM.

I really enjoyed the contest, but lack of numbers on the CW side of the contest — VK2CX.

Enjoyed the time I spent especially on 40 metres — ZL2ALJ.

Good fun — enjoyed the participation — VK2CKW.

This was my first serious attempt at a contest and I found it very enlightening on how friendly it can still be. Many thanks to all the people who I contacted — VK5ZM.

I have quite a number of other letters received with the logs, however space does not permit the publication of extracts from all of these in this issue. I will endeavour to include comments from the balance of correspondence in the next issue.

1986 REMEMBRANCE DAY RESULTS

The formula for determination of results for each Division is: Total Points/Total Divisional Licensees x Weighting Factor.

VK1	6324/ 302	x	1.1	23.03
VK2	13798/4887	x	7.5	21.18
VK3	10252/4559	x	5.9	13.27
VK4	9788/2619	x	6.2	23.17
VK5	15638/1774	x	1.4	12.34
VK6	13400/1438	x	1.5	13.98
VK7	3719/ 587	x	2.2	13.94
VK8	263/ 173	x	6.2	9.42

DIVISIONAL SCORES

VK1		VK4		VK7	
HF Phone	3137	HF Phone	7826	HF Phone	3189
VHF Phone	3187	HF CW	614	HF CW	314
		VHF Phone	1348	VHF Phone	216
TOTAL	6324	TOTAL	9788	TOTAL	3719

VK2		VK5		VK8	
HF Phone	11587	HF Phone	10694	HF Phone	224
HF CW	1543	HF CW	741	HF CW	39
VHF Phone	668	VHF Phone	4203		
TOTAL	13798	TOTAL	15638	TOTAL	263

VK3		VK6	
HF Phone	6223	HF Phone	5774
HF CW	1218	HF CW	513
VHF Phone	2926	VHF Phone	7098
		VHF CW (RTTY)	15
TOTAL	10367	TOTAL	13400

LICENSEES per Division are:					
VK1	302	VK2	4887	VK3	4559
VK4	2619	VK5	1774	VK6	1438
VK7	587	VK8	173		

INDIVIDUAL SCORES BY DIVISION

VK1 DIVISION

HF Phone

1PJ	645	1OO	200	1DW	80	1VB	21
1PP	305	1ZL	176	1BAT	68	1KED	20
1LF	248	1ST	154	1KV	64	1KID	20
1NCO	236	1RH	139	1KCM	52	1GB	15
1WX	230	1TD	95	1MX	30	1WI	12
1RG	212	1BEE	82	1KRD	23	1KEN	10

. POINTS SUB-TOTAL 3137

VHF Phone

1ZAR	301	1KRM	122	3DZB/1	74	1CD	39
1ZIP	260	1ZJR	121	1BAT	62	1ST	36
1ZDJ	214	1DW	115	1RH	60	1KRD	30
1ZDX	214	1ZL	110	1LF	59	1MX	26
1WX	208	1PP	90	1BEE	55	2EY/1	26
1ACC	208	1OK	88	1GB	52	1RG	23
1KNP	160	1TD	84	1OO	44	1KED	20
7ZNP/1	160	1KV	80	1WI	42		

POINTS SUB-TOTAL 3187

TOTAL POINTS VK1 DIVISION 6324

VK2 DIVISION

HF Phone

2KL	651	2NW	162	2IV	76	2TR	32
2BFR	562	2RE	159	2AJO	70	2BDT	32
2SJ	464	2BMZ	157	2FFF	70	2AV	30
2DCL	450	2PN	134	2COP	65	2SCH	30
2DVU	405	2AHV	130	2BMX	64	7GO/2	28
2BAM	380	2DUA	130	2WT	62	2HJ	26
2DXS	328	2ALZ	120	2PY	60	2QC	25
2BJN	327	2CDG	120	2MUD	58	2SA	25
2IYP/P	321	2ZL	111	2CJH	56	2AHA	24
2AOA	317	2ELB	111	2DDW	56	2OE	23
2PD	314	4DO/2	109	2DSM	56	2PC	21
2AGB	301	2KBK	106	2AYO	53	2BTZ	21
2AMU	296	2CKW	102	2CF	51	2MUZ	21
2JBM	248	2BDN	101	2NV	50	2DHH	20
2WI	246	2NNK	101	2PU	50	2CU	19
2BQS	233	2DOZ	97	2ETR	50	2AUZ	18
2PS	231	2EXA	95	2AL	48	2DFY	18
2ARG	220	2PKW	93	2RX	44	2KGX	16
2PMN	216	2HT	89	2CXX	40	2RJ	15
2ARQ	213	2ANO	86	2CJN	39	2LE/P	14
2UM	202	2ABC	81	2KA	35	2AIM	14
2BIP	200	2DQP	81	2BHO	35	2AXS	14
2AGF	182	2AIC	80	2EZB	35	2EMU	14

POINTS SUB-TOTAL 11587
Check Log received from VK2BUT

HF CW

2KM	146	2AQF	81	2PYM	56	2JM	37
2CX	135	2GT	79	2SU	52	2DQL	30
2BAT	121	2DXS	67	2EXN	50	2ED	26
2EL	106	2AZR	62	2VM	46	2CDG	21
2II	96	2CWS	60	2AIC	45	2RJ	15
2DOP	96	2QL	58	2TR	41	2FNR	15

POINTS SUB-TOTAL 1543

VHF Phone

2DFY	139	2BDT	42	2BAM	25	2LZ	11
2HT	100	2EY	35	2AIC	22	2XIJ	10
2ZZX	60	2SJ	30	2BUT	15		
2JGH	56	2BTZ	27	2ELB	14		
2ZRE	44	2ZL	25	2EZB	13		

POINTS SUB-TOTAL 668
Chock logs were received from VK2s KFU and APP

TOTAL POINTS VK2 DIVISION 13798

VK3 DIVISION

HF Phone

3IE	498	3AYF	155	3AJU	90	3DIP	40
3DOM	383	3DBO	148	3DFI	71	3PIZ	36
3ZI	380	3AUM	140	3DVT	71	3AMW	30
3YH	346	3BHU	134	3DNM	60	3VOJ	28
3BRZ	309	3QP	126	3PDW	56	3BLI	25
3ADW	270	3COP	126	3XH	55	3NBN	23
3BMG	221	3AGJ	125	3ZZ	54	3BKU	20
3AVV	218	3ABP	120	3CFI	54	3NIR	20
3FR	215	3CX	115	3BII	53	3DOV	12
3SCD/P	212	3ZJ	106	3BEE	49	3DS	11
3KU	206	3PRN	103	3AMU	47	3BGB	11
3XF	186	3CLS	100	3PTR	47		
3SM	181	3KMA	91	3KCT	46		

POINTS SUB-TOTAL 6223
Check logs received from VK3s ALD and CAL

HF CW

3CGG	160	3DVW	93	3AMD	70	3RJ	35
3XB	158	3CQP	91	3CAL	43	3BMG	35
3NK	132	3DG	89	3FC	42	3YW	23
3KS	100	3BDH	82	3AUQ	42	3BKU	19

POINTS SUB-TOTAL 1218

VHF Phone

3KKZ	455	3ZZ	122	3SM	76	3ADW	31
3BMV	450	3DOM	118	3AVV	54	3AOM	25
3DNY	214	3BHU/P	117	3RJ	47	3XEX	25
3DBQ	171	3BMG	104	3SCD/P	44	3BRZ	24
3BGS	155	3DNM	102	3KCT	40	3BGB	13
3KMA	143	3YRP	100	3CLS	34	3YMW	12
3YFZ	123	3BII	94	3BLI	33		

POINTS SUB-TOTAL **2926**

TOTAL POINTS VK3 DIVISION **10367**

VK4 DIVISION

HF Phone

4WIT	461	4JM	181	4AKK	100	4ES	30
4LT	442	4PJ	179	4NDG	90	4AAD	30
4BTB	421	4BCS	175	4BKM	87	4AGL	26
4YX	414	4IR	166	4AMH	77	4RC	24
4SHB	306	4OX	162	4VAT	66	4UB	22
4BAY	286	4ISA	152	4FX	65	4ADY	22
4AEV	276	4OD	131	4BCH	61	4MU	20
4WIZ	275	4BIF	123	4NBL	58	3NV/4	19
4AEM	271	4BTW	120	4AOE	57	4EV	15
4NW	252	4ACW	118	4YN	55	4AGS	15
4VR	241	4BRS	118	4ADC	53	4UJ	13
4YG	236	4RT	117	4CZ	50	4AOR	13
4AQD	233	4RM	116	4SAA	50	4LF	12
4AOH	211	4BZB	101	4MAW	47	4LU	11
4BJA	202	4ACC	100	4NWX	42	4ZN	10

POINTS SUB-TOTAL **7826**

HF CW

4XW	157	4CI	83	4BRZ	80	4VAT	26
4QY	104	4SF	80	4YG	60	4ACZ	24

POINTS SUB-TOTAL **614**

VHF Phone

4ZBV	206	4ISA	79	4ZCC	43	4RX	19
4YJF	154	4ADC	63	4UJ	38	4GT	17
4ZAL	145	4YEA	62	4UB	28	4KZX	17
4AGQ	118	4AVR	46	4IY	20		
4WIZ	84	4BZB	46	4KU	20		
4VR	80	4PJ	43	4BNL	20		

POINTS SUB-TOTAL **1346**

Check Log received from VK3NV/4

TOTAL POINTS VK4 DIVISION **9788**

VK5 DIVISION

HF PHONE

5OX	808	5BRS	177	5SG	70	5KBY	37
5ADD	601	5AGP	155	5NWT	70	5TP	35
5BI	570	5AJG	153	5OV	69	5AJJ	35
5DJ	550	5WO	140	5KMH	68	5AIB	31
5SU	513	5XT	131	5ANW	67	5BO	30
5ATU	430	5NQP	115	5KCX	85	5AIM	30
5AYD	429	5NF	112	5RV	62	5DH	27
5ZM	425	5AX	108	5PKW	62	5PF	25
5ATC	407	5OU	106	5TL	60	5YX	25
5AJK	325	5IT	105	5AWF	60	5AOV	25
5NOD	291	5IR	100	5BMT	54	5ABY	21
5SJ	243	5KV	100	5NDB	51	5OB	20
5XI	233	5ACW	100	5TZ	50	5ZE	20
5BWZ	229	5BAR	97	5AMF	50	5LC	18
5NMR	228	5FS	92	5OR	47	5KJT	15
5AH	210	5NTX	91	5UJ	45	5YO	13
5AAC	210	5EA	88	5RK	44		
5APC	201	5GV	82	5NIB	42		
5GZ	180	5TW	75	5BWG	41		

POINTS SUB-TOTAL **10694**

Check logs were received from VK5s ADC and AVQ

HF CW

5UM	179	5FX	74	5AU	30	5BWZ	12
5AGX	176	5ADX	72	5JG	17	5BS	11
5GZ	118	5PF	35	5AYD	17		

POINTS SUB-TOTAL **741**

Check log received from VK5RK

VHF Phone

5KCX	360	5KIA	157	5OR	87	5ZAH	39
5AKK	351	5RV	136	5TZ	73	5TC	31
5APC	273	5ADC	134	5AVQ	87	5UE	28
5APA	246	5RR	111	5AWH	55	5FX	24
5ADJ	230	5AJJ	104	5ZBC	53	5AOV	14
5AAC	204	5EA	100	5YX	48	5IR	12
5SS	201	5ACW	100	5KBY	46	5ZKK	12
5ZHB	170	5BMT	100	5IN	44		
5ANW	164	5KMH	92	5AIB	44		
5OZ	163	5AIM	90	5KCI	40		

POINTS SUB-TOTAL **4203**

Check log was receivod from VK5BWZ

TOTAL POINTS VK5 DIVISION **15638**

VK6 DIVISION

HF Phone

6YA	573	6RZ	105	6FC	50	6IW	24
6HO	530	6CX	104	6HE	50	6SA	24
6ED	391	6NMB	102	6RJ	50	6AP	21
6RG	335	6WT	97	6ARD	45	6BO	21
6VS	284	6ACN	97	6SI	44	6DM	21
6AO	213	6ANC	91	6ABR	40	6OW	20
6ZO	212	6XV	84	6UX	39	6MA	18
6YS	206	6QN	80	6AAE	39	6MB	18
6RU	170	6TO	72	6KOJ	38	6OV	15
6AMB	168	6KY	65	6HT	33	6KWN	14
6OD	159	6LW	65	6ZS	32	6AD	13
6FP	147	6CR	58	6YF	31	6YE	13
6DA	142	6ANM	55	6AV	30	6YL	13
6AEA	123	6WIA	52	6KBL	29	6EF	11
6LZ	109	6PV	51	6WU	27	6NSU	11

POINTS SUB-TOTAL **5774**

Check logs were received from VK6s AR and NE

HF CW

6AFW	119	6MQ	60	6WT	31	6BE	16
6AJ	86	6RF	47	6QI	27		
6RU	63	6SM	44	6YS	20		

POINTS SUB-TOTAL **513**

VHF PHONE

6YS	495	6RG	190	6AMB	104	5CR	41
6RO	406	6FC	176	6ZIT	104	6VF/P	32
6CX	357	6YF	175	6AP	102	6PG	31
6ZLZ	353	6ZAP	175	6ML	101	6ON	31
6LZ	343	6ARD	166	6ANI	100	6AWE	29
6PR	341	6WH/P	146	6AO	84	6IW	25
8ABR	290	6ACN	135	6FE	81	6BO	23
6AR	271	6ANC	131	6KWN	81	6GA	16
6OD	266	6ZGP	122	6KBL	71	6DC	15
6PV	215	6TO	120	6SI	55	6UT	14
6WIA	203	6XV	118	6RU	53		
6AD	203	6AEA	108	6CU	46		
6WZ	198	6NE	105	6EB	44		

POINTS SUB-TOTAL **7098**

VHF CW (RTTY)

6ABR 15

POINTS SUB-TOTAL **15**

TOTAL POINTS VK6 DIVISION **13400**

VK7 DIVISION

HF Phone

7KC	456	7NAI	157	7NIM	103	7BD	26
7AMC	405	7LT	151	7KV	94	7CV	25
7GG	399	7JU	150	7KLD	58	7FD	24
7NCP	320	7GH	119	7HK	42	7NBF	23
7YP	164	7AL	117	7BJ	35		
7VK	166	7FL	106	7RM	29		

POINTS SUB-TOTAL **3189**

HF CW

7JE	112	7VK	93	7RY	79	7FN	30

POINTS SUB-TOTAL **314**

VHF Phone

7ZBW	62	7ZJG	39	7CV	15	7KLD	10
7ZJH	47	7RM	28	7AMC	15		

POINTS SUB-TOTAL **216**

TOTAL POINTS VK7 DIVISION **3719**

VK8 TERRITORY

HF Phone

8AZ	67	8KP	45	8BD	42	8NW	18
8DI	52						

POINTS SUB-TOTAL **224**

HF CW

8HA 39

POINTS SUB-TOTAL **39**

TOTAL POINTS VK8 **263**

NEW ZEALAND

Phone

3KR 330

CW

2ALJ	40	4QY	37				

SWL

HF Phone

ARDXC 2151	461	L60068	112
L60036	319	L30371	99
L40604	220	M Chance	54
L50087	139		

VHF Phone

M Rayner	804	M Chance	27
L60036	62		

I now include, just as a matter of interest, some figures which show just how many stations I contacted from each call area outside of VK5 and on what bands. Also shown is a listing of numbers of novice stations contacted, by call areas, on the 80 metre band. To allow some comparison I then have provided figures kindly supplied to me by Phil VK1PJ, summarising his 80 metre band operation. Perhaps there is something to be learned from all these figures or perhaps not!

VK5QX LOG SUMMARY

VK Call Area	1	2	3	4	6	7	8
80 metres	17	100	64	55	52	23	4
40 metres		86	73	49	42	14	2
20 metres		41	2	51	66	4	2
Total	35	227	139	155	160	41	8
Novices		22	13	15	8	6	1

VK1PJ LOG SUMMARY— 80 metres

VK Call Area	Full	Novice	Combined	Area Total
VK2	90	12	10	112
VK3	64	18	6	88
VK4	44	13	4	61
VK5	51	13	4	68
VK6	24	2	2	28
VK7	13	6	1	20
VK8	2	2	0	4
TOTAL	288	66	27	381

GOLDEN ANNIVERSARY COMMONWEALTH CONTEST

Date of Contest From 1200 UTC on Saturday, March 14, to 1200 UTC Sunday, March 15, 1987.

Eligible Entrants All amateur operators licensed to operate within the British Commonwealth or British Mandated Territories. Entries from GB, aeronautical or maritime mobile will not be accepted.

Contacts A1A only in the 3.5, 7, 14, 21, and 28 MHz bands. Contacts may be made with any station using a British Commonwealth call sign except those within the entrant's own call area. An *additional call area* will be created for this contest only by the operation of a special station using the call sign GB5CC. UK operators may contact this station for the purposes of scoring. All entrants are requested to confine their operation to within the lower 30 kHz of each band except when contacting novice stations that operate above 21.100 and 28.100 MHz. A contact exchange consists of RST and serial number commencing at 001. Serial numbers from non-competing stations, when sent, must be recorded.

Scoring Each completed contact will score five points. In addition, a bonus of 20 points may be claimed for the first, second, and third contact with each Commonwealth call area. All British Isles prefixes (G, GB, GD, GI, GJ, GM, GU, and GW) count as one call area, with the exception of GB5CC as previously mentioned.

Logs A separate log for each band must be submitted and to include UTC, call sign of station worked, RST/serial number sent, RST/serial number received and points claimed. Band totals must be added together and submitted on a separate cover sheet. Duplicate contacts must be clearly marked without claim for points. Any unmarked duplicate contacts for which points have been claimed will be heavily penalised, and logs containing in excess of five will normally be disqualified.

Entries Entries may be single or multiband. Single band entries may show, on separate sheets, contacts made on other bands for checking purposes only. Each entry should consist of the separate bands logs, together with a cover sheet declaration stating that the rules have been observed.

Address for Logs Logs should be sent to RSGB HF Contest Committee, PO Box 73, Lichfield, Staffs WS13 6UJ, England. Adjudication commences on Monday, April 13, 1987 and any entries received after this date may not be accepted. It is suggested to send logs Air mail.

Awards The winner will receive the Senior Rose Bowl, and the runner-up the Junior Rose Bowl. Certificates of merit will be awarded to the first, second, and third placings. In addition, to celebrate the 50th BERU/Commonwealth Contest, special mementos will be awarded to the leading overseas station and to the operator who, in the opinion of the Contests Committee, has contributed most to the BERU/Commonwealth contests during the 50 years history of the contests.

Receiving Section Dates and times as above. Only the entrant may operate his/her receiving station for the contest. Holders of a transmitting license for frequencies below 30 MHz are not eligible to enter.

Scoring To count for points, a station outside the entrant's own call area must be heard in a contest contact. CQ or test calls will not count for points. A station may be logged only once on each band to count for points. When both stations are heard they should be logged separately and points claimed for both entries, provided they are both outside the entrant's own call area. Each completed entry shall score five points. In addition, a bonus of 20 points may be claimed for the first, second, and third station heard in each British Commonwealth call area. British Isles prefixes count as one call area.

Logs A separate log is required for each band. Logs should show time/UTC, call sign of station heard, RST/serial number sent by station heard, call sign of station worked and points claimed.

Entries Each entry should consist of logs for each band, a cover sheet and a signed declaration stating that the receiving station was operated within the rules and spirit of the contest and that the entrant does not hold a transmitting licence for frequencies below 30 MHz.

Address for Logs As in the transmitting section.

Awards The Receiving Rose Bowl to the winner. Certificates of merit to the leading entrant in each continent. Also, as in the transmitting section, a special memento will be awarded to the leading UK SWL to celebrate the 50 years of this contest.

COMMONWEALTH CALL AREAS The following call areas are recognised for the purposes of scoring in the 1987 Commonwealth Contest.

A2	Botswana	VP8	S Shetland Is
A3	Tonga Is	VP9	Bermuda
C2	Nauru	VQ9	Chagos
C5	Gambia	VR6	Pitcairn
C6	Bahamas	V85	Brunei
G*	See note below	VS6	Hong Kong
H4	Solomon Is	VY1 /VE8	Yukon
J3	Grenada	VU	India
J6	St Lucia	VU7	Laccadive Is
J7	Dominica	VU7	Andaman & Nicobar Is
J8	St Vincent	YJ	Vanuatu
P2	Papua New Guinea	Z2	Zimbabwe
S7	Seychelles	ZB2	Gibraltar
T2	Tuvalu	ZC4	Cyprus (UK Bases)
T30	W Kiribati	ZD7	St Helena
T31	C Kiribati	ZD8	Ascension Is
T32	E Kiribati	ZD9	Tristan da Cunha, Gough Is
V2	Antigua, Barbuda	ZF	Cayman Is
V3	Belize	ZK1	Cook Is
VE1	Maritime Provinces	ZK1	Manihiki
VE1	Sable Is	ZK2	Niue
VE1	St Paul Is	ZK3	Tokatau
VE2	Quebec	ZL0	New Zealand
VE3	Ontario	ZL1	New Zealand
VE4	Manitoba	ZL2	New Zealand
VE5	Saskatchewan	ZL3	New Zealand
VE6	Alberta	ZL4	New Zealand
VE7	British Columbia	ZL7	Chatham Is
VE8	North West Territories	ZL8	Kermadec Is
VK1	Australian Capital Ter	ZL9	Auckland & Campbell Is
VK2	New South Wales	3B6 /3B7	Agalega & St Brandon
VK3	Victoria	3B8	Mauritius
VK4	Queensland	3B9	Rodriguez Is
VK5	South Australia	3D2	Fiji
VK6	Western Australia	3D6	Swaziland
VK7	Tasmania	4S	Sri Lanka
VK8	Northern Territory	5B4	Cyprus
VK9L	Lord Howe Is	5H	Tanzania
VK9M	Mellish Reef	5N	Nigeria
VK9N	Norfolk Is	5W	West Samoa
VK9X	Christmas Is	5X	Uganda
VK9Y	Cocos (Keeling) Is	5Z	Kenya
VK8Z	Willis Is	6Y	Jamaica
VK0	Heard Is	7P	Lesotho
VK0	Macquarie Is	7Q	Malawi
VK0/ VP8 /ZL5	Antarctica	8P	Barbados
VO1	Newfoundland	8Q	Maldive
VO2	Labrador	8R	Guyana
VP2E	Anguilla	9G	Ghana
V4	St Kitts, Navis	9H	Malta
VP2M	Montserrat	9J	Zambia
VP2V	British Virgin Is	9L	Sierra Leone
VP8	Turks & Calcos Is	9M2	W Malaysia
VP8	Falkland Is	9M6/9	E Malaysia
VP8	S Georgia	9V	Singapore
VP8	S Orkney	9Y	Trinidad & Tobago
VP8	S Sandwich Is		

GB5CC RSGB HQ Station
G* denotes G/GB/GO/GI/GJ/GM/GU/GW

ARRL 160m CW CONTEST

This is the 17th year for this top band activity contest to be held from 2200 UTC, Friday, December 5, to 1600 UTC December 7, 1986.

Exchanges will be between Stateside and VE and DX stations. DX to DX contacts, however, are not permitted.

Classes — Single operator and multi-operator.

Exchange — RST and ARRL section; country for DX and ITU region for maritime mobiles.

Scoring — Contacts between stations in ARRL sections count two points, with DX stations five points.

Multiplier — Determined by the number of ARRL sections plus VE8/VY1 (maximum of 74) and DX countries worked (for W/VE participants). DX stations use ARRL sections only.

Final Score — Total QSO points times (X) the ARRL section and DX multiplier.

Awards — Certificates to the top *scoring* single operator station in each section and DX country, and to the top scoring multi-operator station in each ARRL division and continent.

The ARRL 160 Band Plan requires the W/VE stations to transmit only in the 1.800-1.825 and 1.830-1.850 MHz segments, keeping the *DX Window (1.825- 1.830 MHz)* clear for DX stations. They will indicate where they will be listening for cross frequency contacts.

The usual grounds for disqualification — violation of rules, excessive duplicate contacts, etc — will prevail.

Logs with more than 200 QSOs must include dupe sheets. (A large SASE to the ARRL will usually get the necessary forms to make log keeping for any of the ARRL contests easier).

All entries must be postmarked no later than January 4 and be posted to: ARRL Communications Department, 160 Contest, 225 Main Street, Newington, Connecticut, 06111. USA.

ARRL 10m CONTEST

To be held from 0000 UTC, Saturday December 13, to 2400 UTC, Sunday, December 14, 1986.

This is the 14th Annual 10 metre Contest organised by the ARRL. It is a world-wide activity in which DX stations are permitted to work other DX stations. You are not limited to working W/Ks and VEs only.

The same station may be worked once on phone and again on CW; no cross-mode however, A maximum of 36 hours operating time is permitted out of the 48 hour contest period for all stations.

Categories — Single operator, mixed mode, phone only or CW only. Multi-operator mixed mode only.

Exchange — W/VE stations (including KH6 and KL7) send RS/T and State or Province. DX stations (including KH2, KP4, etc) send RS/T and QSO number starting with 001. Maritime mobiles send RS/T and ITU Region. Novice and Technician stations must identify /N or /T.

Scoring — Phone QSOs are worth two points, CW four points and novice eight points.

Multiplier — Fifty US States, VE call areas, DX countries and ITU Regions.

Awards — Certificates to the top single operator in each category for each ARRL section and DX country, and to the top multi-operator station in each ARRL division and each continent.

Indicate the multiplier only the first time it is worked. Dupe sheets are required for logs with 500 or more QSOs. The usual disqualification criteria will be observed.

Mailing deadline for all entries is January 18, 1987 to ARRL Communications Department, 10 metre Contest, 225 Main Street, Newington, Connecticut, 06111. USA.

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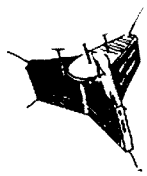


AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SW PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS
Contributions this month are from Bob VK3ZBB, Graham VK5AGR, UoSAT Bulletin Board, and AMSAT-Telemail.

AMATEUR RADIO ON NASA SPACE STATION?

Representatives of NASA, AMSAT and ARRL met recently to begin a long-term program which could lead to amateur radio being a permanent passenger on the NASA Space Station. Members of the Shuttle Amateur Radio Experiment (SAREX) group and others met at the ARRL National Convention in California, to discuss initial ideas for the project. This will be one of the longest projects ever undertaken in amateur radio, taking at least nine years from concept to reality; the Space Station is scheduled to fly in 1995.

The group will develop a plan which would lead to a formal proposal to NASA during 1987. AMSAT-NA will lead the working group for the first steps. Then, when tasks are identified in the proposal effort, ARRL may appoint a task leader and assume the lead role.

One goal of the project is to encourage young people to become involved in engineering, mathematics and science. This has fueled other NASA experiments with amateur radio and amateur satellites, including the previous SAREX projects and the launches of UoSAT-1 and UoSAT-2.

OSCAR-10 RECOVERY EFFORTS

An international group of engineers and command station operators continue attempts to recover AO-10, which has been out-of-control for several months after a memory failure. The failure of the memory crippled the satellite's Integrated Housekeeping Unit (IHU), and commands from the IHU are the only means of controlling satellite subsystems. Without the IHU to perform attitude control manoeuvres, AO-10 will soon enter a period of very bad sun-angles. There will not be enough power available from the satellite's solar panels to keep the battery voltage high enough to operate spacecraft electronics. AMSAT teams are searching for a way to load some limited attitude control software into the IHU, and are also examining ways of making the power-down transition safer.

It is thought that a period without power may allow the failed memory chips to anneal, restoring at least some of the failed memory cells. The period without power, however, may have some adverse effects on AO-10: the batteries will be in a deeply discharged state, and the satellite temperature will be quite low. If the spacecraft goes into this eclipse power-down cycle, recharging of the batteries would begin in November, as sun angles improve. Only then will engineers know whether the satellite has survived.

The team working on the problem includes Ron Dunbar W0PN; Graham Ratcliff VK5AGR; Ian Ashley ZL1AOX; Peter Guelzow DB2OS and Randy Smith VE1SAT.

MEMORY IMPROVEMENTS FOR PHASE-3C

Harris Corporation of Melbourne, Florida, has agreed to supply AMSAT with special memory modules for its Phase-3C spacecraft. The modules are especially radiation-hardened and qualified for use in space. The new Harris modules, valued at $80 000 are produced by Harris' Custom Integrated Circuit Division in Melbourne. They will supply the IHU with 32 kBytes of reliable memory.

Gordon Hardman KE3D, is building a new IHU memory board for Phase-3C. This board must be operationally identical to the one already installed in the satellite, but it must use the new Harris 1Cs. The new assembly will then be delivered to Germany and integrated with the satellite, which will soon undergo further vibration and thermal testing.

With 32k of IHU memory, the Phase-3C IHU could support features similar to the UoSAT Bulletins and WOD.

Current launch schedule for Phase-3C is August 1987. No firm date has yet been established.

UOSAT-OSCAR-9 IS FIVE-YEARS-OLD

UoSAT-OSCAR-9 was launched successfully by NASA on October 6, 1981 on board a Delta 2310 rocket from the Western Test and Missile Centre, Vandenberg Air Force Base, California, at 1127 UTC, into a 554 km, 95 minute, polar, sun-synchronous Earth orbit. The satellite had taken 30 months to design, build and test, ready for launch. Shortly after separation from the Delta launch vehicle, the spacecraft primary VHF data beacon was switched on and telemetry data received at the control station in Surrey. The satellite's first transmissions were also monitored eagerly by hundreds of radio amateurs around the world. Since then, many thousands of radio amateurs; school, college and university groups and other interested individuals in many countries have participated in the technical challenge of receiving, decoding and analysing the housekeeping and experimental data transmitted by the spacecraft.

UoSAT-1 experienced some difficulties between April and September 1982, when both downlinks were inadvertently activated, blocking the command uplinks. This problem was completely overcome with the assistance of the Stanford Research Institute, USA.

UoSAT-1 now operates a regular series of daily experiments scheduled automatically by the OBC. The OBC schedule is loaded every two weeks by the Surrey Ground Control Station.

It is, perhaps, appropriate to summarise the mission objectives established when the project commenced:

1 To investigate the feasibility of, and the problems associated with, the design, construction, test and launch of a relatively small, inexpensive yet sophisticated spacecraft capable of a significant contribution to the engineering, scientific, educational and amateur radio communities.
2 To stimulate and promote a greater awareness of, and interest in, space engineering and science in schools, colleges and universities by direct, active participation in the satellite experimental program. The satellite engineering and experiment data are transmitted in such a manner that they are readily received by, not only professional ground stations, but also simple, low-cost amateur ground terminals.
3 To broaden the scope of the Amateur Satellite Program by catering for the interests of the amateur 'experimenter/scientist' in addition to traditional amateur radio communications.
4 To evaluate the use and performance of novel technologies, spacecraft systems architectures and cost-effective spacecraft engineering techniques to provide a lower cost entry level into space activities.

The UO-9 mission has proved a remarkable success and the spacecraft continues to perform extremely well with no significant degradation thus far detected. The mission has experienced its 'ups and downs,' but each difficulty has been overcome by perseverance resulting in 'better' spacecraft operations and facilities. Indeed, sustained effort on spacecraft on-board computer software and ground control station facilities have resulted in enhanced performance from the spacecraft over the last year!

The UoSAT Team at UoS wish to thank the thousands of experimenters world-wide who have sent in reports, experiment results, suggestions and general support for the mission — not forgetting those who helped us through difficult times!

At five years, UoSAT-1 is the longest living operational satellite in the Amateur Radio Satellite Service.

OSCAR-10 HISTORICAL REPORT

Three Years of Operation with AMSAT OSCAR-10
A Detailed report
by Karl Meinzer DJ4ZC

AMSAT/DL Journal, September/October 1986
(translated by Don Moe DJ0HC/KE6MN)

1 Introduction

AMSAT OSCAR-10 was launched on June 23, 1983 and is the first "Phase-3" satellite in space; its predecessor, P3-A, was lost in 1980 due to a launch failure. Compared to all previous AMSAT satellites, a completely new satellite architecture is employed in the P3 satellites, which represents a significant advance in cleverness and technology. As a matter of course, several risks were also intrinsic to this technological advance; we had therefore estimated the lifetime of the first P3 satellites at three years. In these three years, OSCAR-10 has significantly enriched amateur radio despite many adversities and has reinforced our opinion that this is the correct path to follow. Unfortunately, several problems in OSCAR-10 are now occurring that give cause to believe that its days are numbered. This report will describe in detail what we have learned to date from the P3 project.

2 Failures in the satellite

In a report of this nature, it is appropriate to initially describe the failures that have occurred in the satellite. More important however, is the analysis which would prevent reoccurrence of these problems. In the following enumeration, the presumed causes (P) and the necessary consequences (N) for subsequent satellites will be discussed.

a) Failure of the temperature sensor in the U-transponder's transmitter. The sensor, as are all temperature sensors in AO-10, is a YSI-44203-NTC combination, which consists of two NTC resistors integrated in a bead and which must be supplemented with a resistor in our circuit.

The temperature range is practically linear between -30 and +50 degrees Celsius, and an individual alignment of the channels is not necessary. After 2.5 years of operation, the sensor in channel 06 suddenly indicated significantly too low temperatures, although changes could still be seen.

P A comparison of the indicated temperature values with the probable temperatures from previous operation has lead to the conclusion that the defect was caused by section T2 of the sensor becoming electrically non-conductive.
N The failure appears to be caused by a chance material breakdown. Since our experiences with the sensors are otherwise quite good, there are no consequences.

b) Antenna relay for the 24 cm antennas. During initial operation of the L-transponder, the relay in the arm of the 24 cm directional antenna had over 10 dB attenuation. After the relay was actuated approximately 10 times, a faultless contact was achieved.

P Since practically no current flows through the relay contacts in the case of the receive antennas, the danger of a high contact resistance always exists. The relays have gold-plated contacts and therefore should not have this problem. If, however, impurities are present in the relay, especially at the relatively low temperatures in our satellite, problems can occur.

N In principle, a small DC current could be routed through the contacts. Because we were able to solve the problem by repeater switching, we have decided not to make any changes. Since the relays are practically handmade for the space industry, the danger always exists that a lot of money is paid for a component which does not have the manufacturing maturity of a mass- produced item. Unfortunately, we do not have any alternative.

c) Final amplifier of the L-transponder. Upon initial operation of the L-transponder, the amplification was too little, the output power too low, and the typical distortion of Class-C amplifiers was apparent.

P Analysis of the telemetry data, especially of the currents, has indicated that quite likely the voltage converter for the final amplifier bias has failed. The converter uses two JAN-TX 2N2907A transistors, which come from a space project of NASA. Presumably, one of these transistors has developed an open junction.

N For the same reason, the command detector in P3-A had failed in Kourou. We have subsequently rejected all of these transistors for future projects. The possibility exists that the transistors are "tested to death" in insane acceptance tests. This case has again lead to considerable discussion whether it is really wise to use special militarily qualified components or whether good quality mass-produced items would not be better. It is indeed indicative that in all our failures the "MIL" components are involved, even though we have employed very few of them in out satellites. By the way, the new L-transponder has an entirely different final stage design without a bias voltage converter.

d) Helium bottle seal

Immediately following initial operation of the 400 N motor in OSCAR-10, the helium pressure fell so much that a second ignition of the motor was no longer possible.

P According to telemetry data for the helium high and low pressures, a leak occurred on the high pressure side, causing the gas loss. Probably the screw seal of the helium bottle became loosened so much through the temperature cycles, as a result of the collision following the launch, that the gas could escape.

N For the helium bottle of P3-C, a further sealer was employed in addition to the tin gasket. Tests have indicated that the resistance to temperature cycles is thereby improved. The original seal of the bottle was only designed for 200 bar; at the 400 bar used, another design would be better. Unfortunately, only bottles of the type we use are available.

e) Antennas

Several antenna rods were presumably bent as a result of the collision after launch. The ESA has undertaken all necessary steps to prevent collisions in the future. P3-C additionally has flexible two metre antennas which are not as easily bent. However, damage during a collision is nearly unavoidable; the energy absorbed by the antennas probably prevented damage to the solar cells.

f) LIU

The module for operating the propulsion system (LIU) has a design error such that the ignition time values were incorrectly interpreted by the computer. Thus OSCAR-10 reached the high perigee of 4000 km. This problem could have been solved in software; however, due to space limitations, the LIU has been redesigned, and the crossed lines also corrected at this time.

g) Sun sensor

Operation has indicated that the sun sensor sensitivity must be set very exactly; slight variations cause either a mis-triggering or double triggering.

P The problem is not correctly understood at this time; from the statically recorded graphs, the phenomenon cannot be understood.

N We are presently still building a sun sensor for further tests. These should then indicate which measures should be taken in P3-C.

h) Thermal design

The thermal design of AO-10 was conducted in the USA on a large computer. Just prior to launch, a rough manual calculation indicated that the design would have lead to a much too cold satellite. Measures were taken prior to launch to bring the temperature as far as possible up to the desired temperature of 10 degrees Celsius. In fact, the possible measures were only sufficient enough to raise the temperature to five degrees Celsius. Experience has shown however, that we can live with this value and changes are not planned. Merely the fuel lines to the motor and the battery design have been reworked, in the first case to prevent freezing of the fuel and in the second, to reduce the gradient.

In addition to the above problems, further difficulties have arisen after a long period of operation, indicating a kind of wear due to the high radiation exposure in our orbit, though in principle, they were to be expected.

a) Solar generator

Since the solar cells are mounted on the external skin of the satellite, a larger power decline is unavoidable. The solar cells have a 0.5 mm thick glass cover for shielding. Calculations predicted a 40 percent decline in power in three years. In fact, the power declined 12 percent in six months and around 24 percent in three years. After six months, we reduced the input voltage of the generator two volts compared to the optimal values prior to the launch (29 mV per cell) and have operated with this setting unchanged to this day. The power decline data are referenced to this setting. The solar generator from AEG-Telefunken has exceeded our expectations and can be employed without changes even for missions of significantly longer duration in an elliptical orbit. It may be that an adjustment of the operational voltage after approximately three years would even lead to a small increase in power.

b) BCR

The battery charge regulator receives its voltage settings for the solar generator and battery voltage from the board computer, which sets them depending on temperature. The BCR contains D/A converters whose outputs are routed into the control loops for the voltages. There are two redundant regulators present, although the D/A converters are single. The D/A converters are connected to the regulators through 270k ohm decoupling resistors to eliminate mutual interaction. The input current of the operational amplifier in the regulators has increased in the three years to approximately 1 uA, thereby causing drift. In P3-C, the decoupling resistors must be reduced in value to avoid this drift. In AO-10 the drift is compensated for through corresponding software parameters.

c) The memory of the board computer

There are 12 dynamic 4116 memories flying in

OSCAR-10 APOGEES — DECEMBER 1986

			SATELLITE			BEAM HEADINGS					
			APOGEE CO-ORDINATES			SYDNEY		ADELAIDE		PERTH	
DATE	DAY NO	ORBIT NO	UTC HHMM:SS	LAT DEG	LON DEG	AZ DEG	EL DEG	AZ DEG	EL DEG	AZ DEG	EL DEG
1	335	2608	1621:26	-7	282	274	10	262	20	297	41
2	336	2610	1540:28	-7	272	279	18	286	28	308	46
3	337	2612	1459:31	-7	263	286	26	296	36	321	54
4	338	2614	1418:34	-7	254	293	33	306	43	339	59
5	339	2616	1337:36	-7	244	302	41	316	49	360	60
6	340	2618	1256:39	-7	235	313	48	333	54	21	59
7	341	2620	1215:41	-7	225	327	53	352	57	38	54
8	342	2622	1134:44	-6	216	345	57	11	56	52	47
9	343	2624	1053:44	-6	207	4	58	29	53	62	40
10	344	2626	1012:46	-6	197	24	55	43	48	70	32
11	345	2628	0931:49	-6	188	39	51	55	41	76	24
12	346	2630	0850:52	-6	179	52	44	64	34	82	15
13	347	2632	0809:54	-6	169	62	37	71	26	87	7
14	348	2634	0728:57	-6	160	69	29	78	18	92	-1
15	349	2636	0647:59	-6	151	76	21	84	10		
		2637	1627:31	-6	326					270	1
16	350	2638	0607:02	-6	141	82	13	89	2		
		2639	1746:33	-5	317					275	9
17	351	2640	0526:04	-5	132	87	5				
		2641	1705:36	-5	307			268	-2	280	17
18	352	2642	0445:07	-5	122	92	-3				
		2643	1624:38	-5	296			273	5	286	25
19	353	2645	1543:41	-5	288	271	3	279	13	293	33
20	354	2647	1502:43	-5	279	277	11	285	21	302	41
21	355	2649	1421:46	-5	270	283	18	292	29	313	46
22	356	2651	1340:49	-5	260	289	26	301	36	328	54
23	357	2653	1259:51	-5	251	297	34	311	43	345	57
24	358	2655	1218:54	-5	242	307	41	324	49	6	58
25	359	2657	1137:58	-4	232	318	47	339	53	25	55
26	360	2659	1056:59	-4	223	333	52	357	55	40	50
27	361	2661	1016:02	-4	214	351	55	15	53	52	44
28	362	2663	0935:04	-4	204	9	55	31	50	62	36
29	363	2665	0854:07	-4	195	27	52	45	44	69	28
30	364	2667	0813:09	-4	185	41	47	55	38	76	20
31	365	2669	0732:12	-4	176	53	41	64	30	81	12

SATELLITE ACTIVITY FOR THE MONTH OF AUGUST 1986

1. LAUNCHES

The following launching announcements have been received:

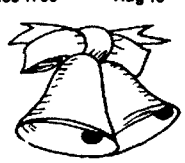
INTL NUMBER 1986	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INCL deg
058A	Cosmos 1768	Aug 02	USSR	89.2	303	199	82.6
059A	Cosmos 1769	Aug 04	USSR	93.3	456	438	65.0
060A	Cosmos 1770	Aug 06	USSR	89.0	302	189	64.8
061A	EGP	Aug 12	Japan	115.7	1808	1490	50.0
061B	JAS-1	Aug 12	Japan	115.7	1506	1488	50.0
061C	MABES	Aug 12	Japan	116.0	1500	1500	50.0
062A	Cosmos 1771	Aug 20	USSR	na	na	na	na
063A	Cosmos 1772	Aug 21	USSR	90.0	370	210	90.0
064A	Cosmos 1773	Aug 27	USSR	89.7	366	181	64.9
065A	Cosmos 1774	Aug 28	USSR	11hr49	39342	614	62.8

Cosmos 1771 (like Cosmos 1736) is a nuclear reactor powered reconnaissance spacecraft. It carries large radar antenna to monitor movements of sea-going vessels. On completion of its mission, the nuclear reactor section is boosted to a higher orbit of about 105 minutes period.

2. RETURNS

During the month 40 objects decayed including the following satellites:

1986-043A	Cosmos 1756	Aug 04
1986-054A	Cosmos 1765	Aug 07
1986-056A	Cosmos 1767	Aug 16
1986-058A	Cosmos 1766	Aug 16



AO-10, which at the time of development of P3-B were the best available memories. Since temporary errors can occur in dynamic memories due to particle radiation, the 12 bits are so employed that in each eight bit word of the computer single errors can be corrected. The software reads and writes the memory every five minutes, thus preventing an accumulation of errors. Even at the time of development, it was clear that this memory in AO-10 would only survive the radiation for approximately three years; unfortunately nothing better was available.

The memory functioned as planned until November 1985 (two and a half years) and corrected about three errors daily. This was no problem and corresponded to our expectations. In November, the counter, which tallies the corrections, began to run very fast. In May 1986, the first "crash" of the computer came to pass.

At that time, a memory test indicated that a column decoder (XX01 and XX81) was defective and that throughout the entire memory errors are distributed, with accumulations "high" and "low." Subsequently, the software was reworked such that positions 01 and 81 are excluded and that the entire memory is read and rewritten in 20 second intervals. This measure has, to date, (August 10, 1986), restored nearly normal operation. However, ever more errors are meanwhile occurring in the K, L, M and N blocks; the memory is becoming increasingly worse, such that the service life of AO-10 cannot be expected to last much longer. A "harder" memory should definitely be used in P3-C; all other systems in AO-10 would most certainly achieve a service life of six to 10 years.

3 Ground systems and software

In contrast to all previous satellites of AMSAT, the P3 satellites have a board computer which is responsible for control. As a consequence, command systems of the old type no longer exist and a dialogue with the board computer has taken their place. After three years operation with this system, there no longer exists the slightest doubt that this is our path into the future. The conversion has not happened quite as painlessly, however, as we had hoped. The command operation of the old type could be distributed "to the folks" by shipping a bale of paper. Initially we also attempted to distribute the P3 technology in this manner and leave the details of their installations to the command stations.

Unfortunately, this concept was a failure; the majority of the stations were not really operational at the time of the launch. One of the biggest problems turned out to be that the S-100 computers, in primary use by Americans, created such a strong interference level on two metres that error-free telemetry reception was not possible. It also became apparent that the training of the people was inadequate. A command training seminar was therefore held in Marburg approximately one year after the launch of AO- 10. At the same time as this meeting, the price of the Atari 800XL computer fell so far that all command stations acquired the same equipment as used in Marburg. Meanwhile, the ground software had become so powerful that one of these computers was adequate for a normal command station. Originally three computers were necessary. Now that we train the amateurs who will be operating command stations every one to two years, the P3 technology has become quite manageable.

4 Outlook

Due to the enumeration of the many problems, the impression could be imparted that we do not yet quite have a thorough grasp of the P3 technology. In fact though, AO-10 is the AMSAT satellite that has functioned with the fewest problems to date, despite all the adversities. Especially the technology of the board computer and the 400 Bit/s synchronous data transmission have played a significant part in immediately allowing us to control this complex satellite with its active attitude regulation, its dual fuel rocket motor, and a plethora of technological innovations. There can be no doubt that here we have selected a path indicative of the future; even the operators of commercial satellites envy us.

SEASONS GREETINGS

To the readers of this column I extend to you all Seasons Greetings and a Prosperous New Year, and I look forward to your continued support in 1987.

—de Colin VK5HI

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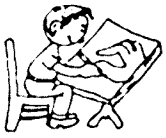


Thumbnail Sketches

Alan Shawsmith VK4SS
35 Whynot Street, West End, Qld. 4101

HARRY B ANGEL VK4HA
— The oldest Active Amateur

In the accompanying photograph, holding a vintage microphone (1935) is Harry VK4HA, who looks and sounds much younger than his 95 years.

Born in England, he sailed around the Horn while still in his teens as an AB (Able Seaman) in a windjammer. Being young and active, his job was to furl the top sails. Eventually, after a look at the USA, he reached VK and put down his roots. It was from Down Under that he enlisted and served in two world wars.

A feature of Harry's first years in amateur radio was his well-organised Sunday morning DJ Broadcast on 80 and 40 metres. He established a large listening audience and received many excellent SWL reports for his work.

Like so many other amateurs he successfully conducted his own radio service business for many years at Toowong, Brisbane. Harry has now retired to Lota, a bayside suburb of Brisbane. He can be found almost daily on the bands working DX in open competition.

In the photograph, alongside Harry VK4HA, is Al VK4SS. Both obtained their AOCPs together in August 1935. After a total of 102 years of radio there were endless stories to swap, with much nostalgia. (The meeting was arranged by courtesy of Roy VK4BAY).

ROY KERR VK4DK

Roy obtained his AOCP at Winton, in 1935. He was very active pre-WWII from this Central Queensland town. Post-war, Roy moved to Tingalpa, Brisbane and continued in amateur radio using war disposals gear.

A PMG telegraphist by vocation, VK4DK was a 'gun' brass pounder, his code being used on OTC radio links. He retired in 1967.

Roy lists his other hobbies as growing champion gerberas for show, likes shooting and fishing — with silver coins (his own cryptic description). Does he mean he likes playing the 'one arm bandits?'

Pre-WWII, Roy's brother Vern VK4LK, operated the Flying Doctor Base Station, VJI, at Cloncurry. Roy used to QSY his rig to the frequency of VJI and hold regular scheds and rag chews with brother Vern. Eventually, the Radio Inspector became aware of this — he was not amused!.

ar

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

Forty years have passed since many of the events on Morotai Island in wartime took place, and although I am now a service pensioner aged 69, I still have a pretty good recall of what happened there when I was a member of the Australian Press Unit, which printed the Army Island Newspaper *Table Tops*, and later, the Broadcasting Station 9AD.

WHAT ARE THE MOST OUTSTANDING MEMORIES OF THOSE DAYS?

I remember that President Roosevelt died the same day we arrived at Morotai on the American ship, the *Frederick C Ainsworth*, which had collected us at Brisbane after being kitted-out and vaccinated at Logan Village and Strathpine. We received the news soon after 6 am whilst we were below decks awaiting a disembarkation order. This is how I know the exact day we arrived.

I remember being present at one of the war trials that were held on Morotai soon after the Pacific war ended. It was not a pleasant experience.

I also recall listening by radio to General McArthur, on board the *Missouri* in Tokyo Bay, when he accepted the formal surrender. I was also present at the surrender on Morotai itself, accepted by General Blamey.

MONKEYING AROUND

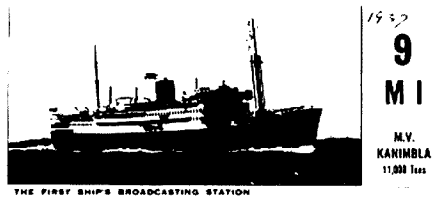
Other memories come flooding to me also. Like the day a Borneo monkey, which was one of my mates pets, discovered an 807 valve that I had acquired and took it to the top of a tree near my tent. There he was, perched on a limb with 807 in his hand, grinning like the monkey that he was, and acting as if to drop it while I stood shaking my fist, far below. Eventually he did drop it but it fell on soft ground and fortunately did not smash!

The same monkey also had a great liking for anything shiny, such as mirrors, and he would purloin these given the opportunity if the boys left them laying around. One day we returned to our tent to find the monkey looking rather "green around the gills" or whatever monkeys look like when they are not too well! It appeared that he had taken a shine to someone's Atebrin tablets and he looked so sick we thought he would die. But Borneo monkeys are tough little animals and he survived.

I was on Morotai for about nine months, but I packed more into that nine months than I have done since in a lifetime!

When 1946 arrived we were still on Morotai. We were advised that there were no ships available to bring us home, so the troops amused themselves with varying pastimes. Some raided a nearby aircraft dump to get plastic to make souvenirs to sell to the Americans or to send home. Another chap and I used to frequent this dump to locate wire and other bits and pieces so we could repair radios for the BCOF troops, who were passing through on their way to Japan. We were paid in Dutch Dollars.

Eventually, the time arrived for us to leave. The broadcasting station and newspaper had closed down for the last time, many units had already departed, and Morotai was beginning to look somewhat forlorn.



QSL card received by VK3OZ, in 1937. Written on the back of the card: Thanking you for your letter and report on Marine Station 9MI. Yours faithfully, Eileen Foley, Announcer-In-Charge.

HOMEWARD BOUND AT LAST

At last the ship arrived to bring us home. It was the motor vessel *Kanimbla* of the McIlwraith McEacharn line, formerly a passenger ship on the Australian coastal run, but now a troopship. The *Kanimbla* had a special significance for me as a prewar shortwave listener, because it had a broadcasting station on board, and I used to listen to concert broadcasts from the ship as she traversed the coast.

Bert Shire VK3OZ, 81 years old and now of Mildura, was also a shortwave listener at that time, and sent the ship's radio operator a signal report in 1937. In due course he received a QSL card from the Announcer-in-Charge, Eileen Foley. Eileen's card thanked Bert for his report and gave some details of the frequencies and power used by this marine station.

Call Sign — VK9MI
Frequency — 11710 kc (25.619 metres) and 6010 kc (49.917 metres)
Power — 50 watts aerial rating
Transmitter — AWA High Fidelity

Bert was kind enough to supply me with a photocopy of the card. It is also interesting to note that 9MI claimed to be the first ship's broadcasting station. Isn't it a pity there are not some of them still around today. It would surely add to the joys of shortwave listening.

I am sorry I have missed so many deadlines but this time I am just in time to wish all Season's Greetings and say thank you for the many kind words that you have made to me personally on air.

My story is only one of many that could be told if only others would put pen to paper and so related their experiences during WWII.

There is much more to come about my experiences in the immediate postwar years when, like so many ex-servicemen, I found it difficult to settle back into civilian life and I had to fight this other kind of war in which I found myself involved.

A very Happy Christmas and 73 to all readers — Joe VK2BJX.

ar

ELECTRICITY

Today's scientific question is: What in the world is electricity? And where does it go after it leaves the toaster?

Here is simple experiment that will teach you an important electrical lesson: on a cool, dry day, scuff your feet along a carpet, then reach your hand into a friends mouth and touch one of his dental fillings. Did you notice how your friend twitched violently and cried out in pain? This teaches us that electricity can be a very powerful force, but we must never use it to hurt others unless we need to learn an important electrical lesson.

It also teaches us how an electrical circuit works. When you scuffed your feet, you picked up batches of "electrons," which are very small objects that carpet manufacturers weave into carpet so that they will attract dirt. The electrons travel through your bloodstream and collect in your finger, where they form a spark that leaps to your friends filling, then travel down to his feet and back into the carpet, thus completing the circuit.

Amazing electronic fact: if you scuffed your feet long enough without touching anything, you would build up so many electrons that your finger would explode! But this is nothing to worry about unless you have carpeting.

Although we modern persons tend to take our electric lights, radios, mixers, etc for granted, hundreds of years ago people did not have any of these things, which is just as well because there was no place to plug them in. Then along came the first electrical pioneer, Benjamin Franklin, who flew a kite in an electrical storm and received a serious electrical shock. This proved that lightning was powered by the same force as carpets, but it also damaged Franklin's brain so severely that he started speaking only in incomprehensible maxims, such as, a *penny saved is a penny earned*. Eventually he had to be given a job running the post office.

After Franklin came a herd of electrical pioneers whose names have become part of our electrical technology: Myron Volt, Mary Louise Amp, James Watt, Bob Transformer, etc. These pioneers conducted many important electrical experiments — among them, Galvani discovered (this is the truth) that when he attached two different kinds of metal to the leg of a frog, an electrical current developed and the frog's leg kicked.

The greatest electrical pioneer of them all was Thomas Edison, who was a brilliant inventor despite the fact he had little formal education. Edison's first major invention in 1877, was the phonograph, which could soon be found in thousands of American homes, where it basically sat until 1923 when the record was invented. But Edison's greatest achievement came in 1879, when he invented the electric company. Edison's design was a brilliant adaption of the simple electrical circuit: the electric company sends electricity through a wire to a customer, then immediately gets the electricity back through another wire, then, (this is the brilliant part) sends it right back to the customer again.

This means that an electric company can sell a customer the same batch of electricity thousands of times a day and never get caught, since very few customers take the time to examine their electricity closely. In fact, the last year any new electricity was generated was 1937; the electric companies have been merely reselling it ever since, which is why they have so much time to apply for rate increases.

Today, thanks to men like Edison and Franklin, we receive almost unlimited benefits from electricity. For example, in the past decade scientists have developed the laser, an electronic appliance so powerful that it can vaporise a bulldozer 2000 metres away, yet so precise that doctors can use it to perform delicate operations to the human eyeball, provided they remember to change the power setting from "Vaporise Bulldozer" to "Delicate."

So anyway, next time you get a bill from the electric company, just send it right back, with an attached note explaining, "Haven't seen it all month!"

—Contributed by Len Pearson VK3LP

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

WHY XYL?

I have received an interesting letter from Lloyd VK2VZB, regarding the use of *XYL* for wife. Lloyd says that many amateurs consider XYL inappropriate terminology because, to quote from his letter, "They are still young to us."

He further states that these "oldies" who dislike the term XYL use *GL* (Good Lade) instead.

Well Lloyd, on the other side of the coin, we use the expression *OM* even if the gentleman we are referring to is in his early 20s, but there is a lot to be said for your idea, and "good lady" certainly has a pleasant, old-worldish ring to it; there is food for thought there!

Lloyd grew up with Morse, and knew Mrs Florence McKenzie many years ago. He says:

"Why not promote GL to the fraternity and give wives of amateurs a status? I am sure Mrs Mac would agree — I had the privilege of being associated with that VGL in 1939/40. Having been an ex-Army Cadet Signals we had a little in common. AWA York Street conducted the first RAAF radio op training school and our lunch was supplied by Mrs Mac at her Sussex/Kent Street rooms. We used to march from York Street to these rooms, which were set up with benches with Morse training facilities."

Thank you for your comments and reminiscences, Lloyd.

Maybe *XYL* does conjure up visions of the little woman clad in dowdy clothes and voluminous apron, surrounded by wailing children, piles of washing and dirty dishes in the sink while the OM sits serenely in his shack and works the world, (or the OM down the road!).

Surely this scenario is somewhat inapt for this day and age, when more and more women are becoming actively involved in the world of amateur radio.

Fortunately for us, the general term for a female amateur radio operator is *YL*, whether she be nine or 90. *YL* appears on the ALARA logo, badge, stickers, etc, and is in fairly general usage throughout the world.

XYL or *GL* for wife? Can tradition be changed anyway? Comments welcome!

YL CONTESTS

YL-OM MIDWINTER CONTEST

The English YL club, BYLARA; the Belgium club, BYLC; the Dutch club, DYLC; and the Italian YL club, YLRC, organise this contest.

DATE — the weekend January 10 and 11, 1987.

CW Saturday, January 10, from 0700 UTC to 1900 UTC

Phone Sunday, January 11, from 0700 UTC to 1900 UTC.

BANDS — all bands. Please use band-sections according to IARU recommendations for Region 1. CW and SSB (no cross-mode).

EXCHANGE — station worked RS/T and QSO-serial number. OMs start at 001; YLs start at 2001, Country. Entry in log must also show time, band, date, YL or OM, number of multiplier.

POINTS — each QSO with a YL, confirmed, counts as five points. Each QSO with an OM counts as three points.

SWLs — each different heard YL station counts as five points, multiplier as below. Logs must also show the foreign station worked with.

MULTIPLIERS — one point for every worked DXCC country. Multipliers are counted only once in the contact; it is not counted on each band.

AWARDS — a certificate will be awarded to the YL and OM winner in each category and also to second and third classified stations. Certificates will also be awarded to each country winner in each category.

LOGS — to be sent no later than February 20, to Dieuw Wildeboer PA3CEB, Kettingweg 3, 8281 PN Genemuiden, The Netherlands.

YL-OM CONTEST
Sponsored by YLRL

Phone starts Saturday, February 14, 1987 at 1400 UTC and ends on Monday, February 16, 1987 at 0200 UTC.

CW starts Saturday, February 28, 1987 at 1400 UTC and ends on Monday, March 2, 1987 at 0200 UTC.

OPERATION — all bands may be used. No cross-band operation. Net contacts and repeater contacts do not count. A station may be counted only once in each contest for credit. Participants may work only 24 hours of the time.

EXCHANGE — station worked, QSO number, RS/T, state/province/country. Entries in log must also show time, band, date and transmitter power.

SCORING —

a Phone and CW will be scored as separate contests. Submit separate logs for each contest.
b One point is earned for each different station worked: YLs count only OMs and OMs count only YLs.
c Multiply the number of QSOs by the total number of different states/provinces/countries worked.
d Contestants running 150 watts or less on CW and 300 watts PEP or less on SSB may multiply the results of c by 1.25.

LOGS — must be signed by the operator and no logs will be returned. Remember to file separate logs for each contest. Logs must show claimed score and be postmarked by March 16, 1987, and received no later than March 31, 1987. Please send logs to: YLRL Vice-President, Mary Lou Brown NM7N, 504 Channel View Drive, Anacortes, WA 98221, USA.

ALARA AWARD

Award No 120, July 31, 1986 to T K Morrison VK3DVZ.

Our Award Custodian has been receiving award applications which do not comply with the rules; eg $2 enclosed Instead of $3, unsigned, not certified by two other amateurs, etc.

It seems unfortunate that awards have to be refused on these grounds, particularly in these days of rising postal charges. Please check the rules carefully before forwarding an award application to avoid disappointment. Rules have been well publicised.

SUBSCRIPTIONS

It is that time of the year again, and subscriptions are due once more. Please do not forget sponsored members.

$6 Australian member (full or associate) and subscriber.
$6 Air mail overseas member or sponsored.
$4 Surface mail overseas member or sponsored.

Please send subscriptions to our new Treasurer, Val Rickaby VK4VR, 3 Dulcie Street, Salisbury, Qld. 4107.

It was very enjoyable on a recent trip to Victoria to meet Daphne VK2KDX. We have got to know each other via amateur radio over several years, but this is the first time we had actually met. Naturally, there was much talk and plenty of cuppas before the OM finally managed to drag me away to continue our journey. It is good to meet an "old" friend for the first time, isn't it!

I would like to wish everyone a very Happy Christmas, and all the blessings of the Festive Season.

See you in 1987!
73/33, Joy VK2EBX.

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

AUSTRALIA'S YOUTH — AND THE AMATEUR SERVICE — 1986 — AND THE NEXT 10 YEARS

Guest Writer: Danny McManus VK3NG

While recently addressing a radio club in VK3 on what was a "potpourri" of amateur radio, several lines of thought were brought to light that provide a basis for this article.

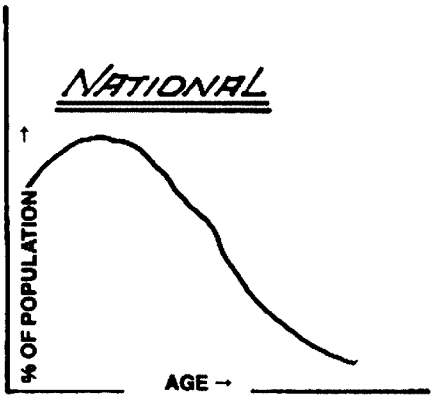


Figure 1 (a).

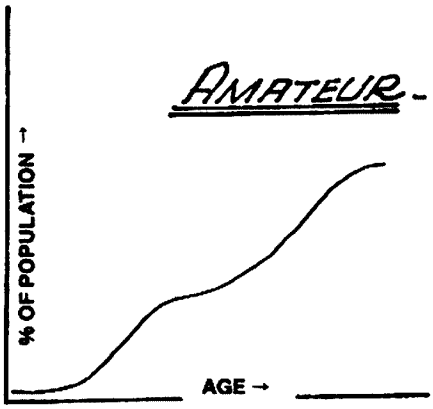


Figure 1 (b).

Figures 1 — Show (a) Age as a percentage of total national population versus (b) Age as a percentage of amateur population in Australia.

The subject was raised by comparing two graphs (Figures 1a and 1b), the amateur population — age versus percentage — to the national average. One glaring conclusion is that the amateur service attracts or consists of middle-aged or older citizens and that, for some reason, we are failing to attract this country's greatest resource — its youth — (let me say at this point that there is nothing wrong with attracting an older percentage of the population, but to me there is something wrong with our failure to attract youth into our hobby). So, why have we apparently failed? Perhaps the advent of cheque book amateur radio could be addressed (or is it credit card amateur radio?). Table 1 shows current? prices for a small range of popular radio gear and the question posed is *how many 16 year olds can afford that lot?*

Table 1 — What 16 year old can afford this:

IC-731	RRP $1554
FT-757	RRP $1295
FT-209RH	RRP $469
"Down Market" perhaps:	
80 metre transceiver	$350
or Rotators from	$280 to $500
or Triband Beams just	$429
even Cheap Verticals at	$150
and Coaxial Cable a mere	$180 per roll
Secondhand?	
IC701	$700
FT7B	$400
FT101	$480
TS520	$450
TOTAL?	$2000 plus perhaps?

The response often forwarded is *get them started with simple CW gear on 80,* or *they can afford computers so they can afford radio gear.* Both responses show conservative and backward thinking. How many people reading this article are 80 metre CW operators only, or would be happy to be? And, how many of you are 16 years old? A 16 year old would see this as a move back to the ark. Because it was good enough for you 30 years ago does not mean the logic still holds. The second point may be valid, but as VK2ZTB and VK3PC point out in their AR article, if Personal Computers are where the interest of today's youth lies then we must move to accommodate this interest — not stand off and adopt the attitude that we will accommodate them when they come to us on our terms. And, of course, many of today's youth cannot afford Personal Computers either. In the school where I teach, the student population of 650 probably boasts fewer than 15 to 20 Personal Computers. If we are genuine in our belief that amateur radio is a pursuit that has a lot to offer today's younger generation then we need to consciously strive to ensure not only does the hobby ignore political barriers, but it is not restricted by socioeconomic barriers either.

The second interesting point to emerge was the radio club's belief that there was already enough avenues into amateur radio without adapting any changes to our current licensing system. I am not sure of their logic because the evening was not dedicated to this single issue, but the issue is surely as simple as setting up the maximum number of entry points into our hobby, whilst ensuring maintenance of standards and protocols that the majority of amateurs see as important. The broader the access to our hobby becomes, the more likely we are to attract outsiders into our ranks — both young and old.

The third issue addressed was how do we sell ourselves to the public, but youth in particular. If indeed today's youth are heavily into Personal Computers, then the first stop should be a soft-sell via computer bulletin boards, something the WIA could well address, as well as club members with access to bulletin boards. Schools are another starting point — perhaps not only in the traditional, amateur addresses students, routine but by using courses such as VK3s STC, a Year 12 student negotiated curriculum course or as an integral part of Year 10/11/12 electrical or electronic practices course. Once again, a little investigation from each Division in association with their State's education authorities should reveal new avenues into schools.

Public education should form an important part of our overall approach to expansion. Check your Division's annual expenditure on Public Relations exercises/materials and then talk to a Divisional councillor. Clubs are often reluctant to organise displays in shopping centres or similar venues because "last time the public did not come near us." Of course they didn't! — you must go to the public. You are selling the product and so the initiative lies with you! It is very difficult to approach the kid with the punk hairdo, but he is probably as nervous of you as you are of him/her.

There are several more subtle ways to educate the public young or old. Doctors and dentists surgeries hold a captive audience, as do hospitals and the like — so make sure your old *Amateur Radios* end up in these places rather than at the local tip or incinerator — anything beats a two year old copy of *Women's Weekly*.

And the kid who puts petrol into your car and comments on the big CB set! The WIA have a pamphlet explaining amateur radio and how to get involved — obtain 20 from your Division and leave them in your car to answer the "ignorant public's" questions.

Amateur radio books in your library? Why not? They should be there! If they are not, ask for them to be put in your library or check out with the WIA Federal Office for what is available and donate it to your library, making sure the odd pamphlet or two is placed on the information boards.

Perhaps why we have failed to attract young blood into our hobby is academic but how we can attract young people is very important. Young people will give a hobby a much needed new lease of life and give a new perspective to where we are headed — imagine 40 metres with a thousand new stations causing the intruders interference! !

Our hobby by its very nature has much to offer young people, but it is up to us to ensure that we let them know about it and give them every opportunity and encouragement to become part of it. The thoughts of one famous American went along the lines — *It's not what my hobby can give me, but what can I give my hobby.* What have you given your hobby of late?

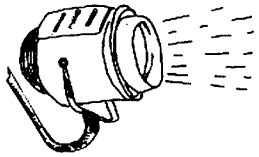
QSP

LIMITED CW

The use of CW is permitted on the VHF and UHF bands by holders of the AOLCP. This is not news — and has been previously published in AR magazine and included on WIA broadcasts.

However, comments at recent club meetings and on air show that some AOLCP operators are still unaware of the change which gives them the right to use CW.

Many have been heard operating with CW either to get their speed up for the DOC examinations or as an added mode for working DX.



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Well, another year has come to an end! There have been few surprises and a number of disappointments, mostly related to poor propagation. There have been a few new stations on the air, while some services are being curtailed. Fortunately, I believe that conditions are slowly improving and these summer months should see the higher frequencies more active, especially during the late evening hours. This will make up for the atrocious QRN on the lower frequencies from all the electrical storms, which will render these bands virtually unusable.

RE-BROADCASTING

At the beginning of October, we saw the commencement of re- broadcasts of Radio Japan (NHK), in Tokyo, from the Sackville site of Radio Canada International. This is as a result of a co-operative agreement signed by the representative governments. RCI has been engaged in re-broadcasting both the BBC and Deutche Welle, to North America, for many years. So it is not new to them. Radio Japan has also been using the facilities of Radio Gabon — *Africa No 1* — to get their signals into Europe and Africa.

On October 1, the first transmission went out on 6.120 MHz, at 1030 UTC, directed to the east coast of North America and surprisingly, was well heard here in Tasmania, which is well out of its target area. The program was 30 minutes in Japanese and 30 in English. Incidentally, the same program is going out on 7.140 and 11.815 MHz simultaneously from the Yamanta site, beamed to south-east Asia. When North America went off daylight saving on October 26, the broadcasts were aired one hour later. Radio Japan consistently comes in strongly, broadcasting to Australia on 15.235 MHz from 0500 UTC in Japanese and English.

GETTING THE SIGNAL THROUGH

The BBC, earlier this year, commenced utilising the Far Eastern Relay Station in Singapore, to get their 0600 release to Australasia through, because signals from the UK bases were not getting through. They are still using 15.360 MHz from 0600 until 0915 UTC, with this arrangement. Now they have been forced to utilise one of the old faithful channels from another site, because of the days getting shorter over in the UK. So the Antigua base, in the Caribbean now has moved onto that channel from 9.510 MHz, where it had previously been suffering co-channel interference from an Algerian station that was 1 kHz low, causing a very nasty heterodyne. And the move has paid off.

WATCH FOR CHRISTMAS PROGRAMMING

Do not forget the special Christmas programming that the BBC World Service usually emit during the Yuletide Season, culminating with the Queen's Christmas Message at 0930 UTC. This is usually followed by the very beautiful *Festival of Nine Lessons and Carols* from Kings College, Cambridge. Other stations will have special Christmas programming, especially Radio Vatican, with a broadcast of Midnight Mass from St Peter's Basilica and the Midnight Mass from the Church of the Holy Nativity in Bethlehem is often relayed by Kol Israel in Jerusalem.

I do not have the approximate times or frequencies available at the present time, as this is being written in mid-October. So a little eavesdropping will be in order around Christmas Morning, from 2200 UTC until 0130 UTC on the 25 or 31 metre bands.

IT'S GOING TO HAPPEN

in a recent column, I happened to mention that it was rumoured that the *Christian Science Monitor* was going to purchase *KYOI — Super Rock*. Well, this has, in fact, happened. I have not heard KYOI lately so perhaps they are preparing for the conversion to come on-stream about the same time as the State-side operation is going to commence, early in 1987.

NDXE (pronounced *In Dixie*)

Yet another station is not on-air! The much-vaunted NDXE, which was reportedly going to transmit with AM-Stereo on HF has not appeared, and the consensus amongst the State-side fraternity is that it might not, although it is heavily into promotional material, eg cups, licence plates, a 3D holographic card and other trinkets. Most will believe it when they hear it! By now, it may be on the air, but don't hold your breath waiting.

THE MOST . . .

One station that I would vote as the most improved broadcaster in 1986 would be Radio Beijing. Compared to programming 10 or 15 years ago, when there was Maoist rhetoric and not much worth listening to, RB today is quite refreshing and interesting to listen to, especially their World News, plus Domestic News bulletins. They have nice musical interludes and interesting interviews, with a minimum of propaganda. Radio Pyongyang, in North Korea, still remains the most boring and repetitive with endless slogans and propaganda.

We will see what 1987 will bring in four weeks time. Until then, it remains for me to wish you the compliments of the Season and a Happy 1987 to you and yours.

—Robin VK7RH

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

If you hear an AM station on 14.000 MHz announcing as "Idha'at al-Jamahiriya al-Arabbiya al-Libya ash-sha'abiya al-ishtirakiya", you could be forgiven for thinking that your receiver has developed addled innards! What you would be hearing is the "Libyan Jamahiriya Broadcasting" from Tripoli, which broadcasts a program daily in Arabic, from 1000 to 1600 UTC . . . or so intruder reports from DJ9KR tell us.

This is bad news for amateurs and SWLs in IARU Region 1, but hopefully it will not affect us here in Region 3.

The station has another output on 15.415 MHz, which does not really concern us. Actually, in spite of my monthly lamentations on the intruder problem, we really do not suffer as much as those who operate In Region 1.

In spite of the wonderful distances that radio waves can travel, (except when one is straining to exchange signal reports with a new country), we do not hear the greater percentage of intruder stations which emanate from Region 1, and it appears that we in the antipodes are not only somewhat isolated geographically from the rest of the world, but apparently are also isolated a little with regard to radio propagation. Or so it would seem.

As far as the non-receipt of intruder signals originating in Region 1 are concerned, this is no load to bear. There are, of course, plenty that we do hear in VK.

Those who helped us to keep an ear on them last August were:
VK2s DEJ, EHQ, MT, PS, QL, Arthur Bradford, VK4s AKX, BHJ, BTW, DA, KAL, KHZ, OD, VK5s GZ, TL, VK7RH, VK8s BEM, FT, HA and JF

Intruders using broadcast-mode numbered 303; those using CW-mode 100; RTTY was employed by 68; and 54 were reported using modes others than the preceding. There were 46 stations which identified.

In this column in November, I mentioned that there is some sort of commercial operation regularly on 14.051 MHz, in CW, which is coming from Indonesia. I have written to the Indonesian Amateur Radio Society (ORARI), seeking their help in deal with the problem.

The Intruder Watch Information Pamphlet has been reprinted, and your Divisional Intruder Watch Co-ordinator should now have stocks. If you wish to know more about the Intruder Watch, drop him a line and he will send you a copy.

As I close the column for this month, it is again with great pleasure that I extend greetings for the Christmas season to all, and nominate my wish for 1987 to be — *More DX and Less Intruders*. Merry Christmas from VK2COP

QSP

VHF HAPPENINGS IN VK6

Two-metre contact was established between Darwin and Koolan Island, when Dougall VK4KUY/6, using 30 watts through a nine element Yagi, worked into Darwin's Channel 8 Repeater on September 10, from 1200 to 1255 UTC and again on September 11, at 1545 UTC. Stations Dougall worked included VK8s ZWM, LM, DI, ZED, PC, KJJ and TA.

A first for two-metres was created when Brian VK6AIH, Port Hedland, worked Ron VK6UF on Koolan Island. Ron recently bumped his output to 200 watts on FM.

Carnavon Repeater, VK6RCA has been operational on 146.075 MHz input and 146.675 MHz output. Jim VK6CA, had the repeater running from his QTH in late September and further tests were to be carried out at the Carnavon Lighthouse, a tower of about 100 feet (30m) right on the coast which should be ideal for ducting up and down the coast. If the location proves suitable, Jim will apply for permanent permission to use the tower.

Dave VK6YA had a short QSO with JA on 52.050 MHz, September 12, at 0830 UTC. Signals were 5/9 and JH8MQZ/5 reported hearing VK6RTT, as well.

—From the *North West Amateur Radio Society*, October Newsletter

OTHR GO AHEAD

The Australian-designed over-the-horizon-radar system, *Jindalee* is to be installed in two, or possibly three sites in addition to the experimental Alice Springs location.

Cross-referencing between the sites will enable surveillance of aircraft and ship movements on Australia's northern approaches.

Radio Amateur Old Timers Club

Kevin Duff VK3CV
Publicity Officer
Radio Amateur Old Timers Club

MONTHLY OLD TIMERS NET

Despite poor band conditions, the monthly News Bulletin and call-back has been well attended. Thanks to the efforts of the Net Controller, Mac McConnell VK3RV, and his team, the monthly news broadcast and call-back is on three frequencies; 7.060, 3.624 (transmitted by Eric VK3KF and copied by many interstate stations), and 145.700 MHz FM, for Melbourne listeners only.

The net is on the first Monday of each month, commencing at 2300 UTC. Call in and join the Club.

The President, Secretary, and Committee Members of the RAOTC wish to thank all members for their efforts in making the year, 1986, a very good one for the Club. We wish you and yours a very Happy Christmas and New Year.

The RAOTC Secretary/Treasurer, Harold Hepburn, would like to thank members for donations made over the last few months. We are very appreciative of these! Our finances are not shaky, but sometimes a little on the parlous side. We do appreciate the recent donations from Max Austin VK2KZ, Allen Doble VK3AMD, P Sebire VK3MX, Lay Cranch VK3CF, Ron Anderson VK5GM, Eric Ferguson VK3KF, Snow Campbell VK3MR, and Keith Valentine VK3AKB. Thank you gentlemen, for your efforts.

ODE

Lives there a ham with soul so dead
Who never to himself has said:
"What in heck has that mailman done
With the card from Contact Number One?"

VALVE BANK

This is not like the *Blood Bank*, it is more like a *Heart Bank* if you have a piece of equipment that needs a valve transplant. It is being run by Ron Higginbotham VK3RN, who is collecting donations of old valves, testing them as far as possible, and making the usable ones available for sale at 50 cents for receiving types and $1 to $2 for transmitting types — with a "money-back" guarantee.

The proceeds go to club funds. If you could use a re-cycled valve, see Ron; or if you have a box full of old valves that you do not have the heart to throw out, Ron will be pleased to take them off your hands.

—Extracted from the Moorabbin and District Radio Club Newsletter *APC*, September 1986

RAOTC LUNCHEON

The Annual Victorian Luncheon of the RAOTC was held on Wednesday, September 24, at the Melbourne City and Overseas Club. It was well attended with 39 members being present. This was purely a social event and all enjoyed the cuisine and meeting old friends and new ones.

RAOTC President, Max Hull VK3ZS, was Master of Ceremonies. Apologies were received from 11 members from three States. Max told us that Gavin Douglas VK3YK, had suffered a mild stroke, but is now recuperating. He assures us that he will be attending our next function and sends best wishes to all of his friends. Best of 73 to you Gavin for a speedy recovery, from your RAOTC friends.

Graham Sutherland VK3AGS, a recent member, attended this function and was "welcomed aboard" by the President and all members. 73 to you Graham.

Max Hull told members a very pleasant and interesting story. Jim Marsland VK3NY, was licenced in 1931 and was a very early editor of *Amateur Radio* magazine and continued this well into the post-war years. His son, Allen, who is a school teacher at Mount Beauty, has now completed his full licence and has been allocated his father's call sign, VK3NY. Congratulations Allen and Old Timers will look forward to hearing you on the air.

Allan Doble VK3AMD, gave an interesting talk on a subject most amateurs know well — that is line QRM from television sets producing interference on the amateur bands, mainly on the 1.8, 3.5 and 7 MHz bands. Help is needed from suitably equipped amateurs who may be able to investigate these problems. If you can help, please contact Allan Foxcroft VK3AE.

There were no official speakers at this luncheon, but Bill Gronow VK3WG, provided some very humorous anecdotes concerning early Wireless Institute exhibitions and the problems involved and solved. He also spoke about going aloft in an DH88 aircraft to sort out the problems with the transmitter. This was done, but the pilot overshot the Essendon Aerodrome and caused havoc with the poultry farm at the end of the strip! ! ! However, second time around they landed safely and all was well.

Ivan Hodder VK3HR, also had a story. He was a Radio Inspector in 1939 and was asked to install a series of radio towers between Alice Springs and Darwin. He was working by himself and some of his stories about the problems of using local help were very funny indeed. He once joined a Lockheed 10 aircraft for a flight to Darwin. He offered his services as radio operator to the two pilots, but because of a mix-up, the pilots thought that he was also a pilot and the result was that he was left in control of the twin- engined plane for a considerable period, even though he had never flown an aircraft before. He found it most enjoyable; however you could imagine how the pilots felt when they discovered this! ! ! This story of Ivan's brought the house down.

Our net controller spoke briefly about the new net frequencies after which this very successful luncheon came to a close.

RAOTC NOTES

We are a little ahead of ourselves, but would like to advise members that the Old Timers Dinner will take place on Thursday, March 5, 1987 and will commence at 7 pm. The venue and the price of the Dinner have not yet been decided, but members will be advised about these soon. Mark it in your diary — March 5, 1987 The Old Timers Dinner!

PERSISTENCE

Nothing in the world can take the place of persistence;
Talent will not — nothing is more common than unsuccessful men with talent;
Genius will not — unrewarded genius is almost a proverb;
Education will not — the world is full of educated derelicts.
Persistence and determination alone are omnipotent.
The slogan "Press On" has solved and always will solve the problems of the human race.

—Alleged to have been written by Teddy Roosevelt of the USA

THE WORLD'S LONELIEST RADIO

Located in the Coral Sea, about 400 miles east of Townsville, Queensland, is a small coral island about 500 yards wide. This is Willis Island, the home of the world's loneliest radio station. On this island for a year at a stretch, live two radio operators whose duty is to observe the readings of weather instruments and transmit them to the mainland. By this means the Weather Bureau is able to forecast cyclone warnings, and weather forecasts at least 24 hours before they would otherwise be able to do so.

The station has been in operation for about 10 years. For the last couple of years, the monotony has been relieved by the installation of an amateur radio station with the call sign of VK4SK. For six months, the operators see no other human besides themselves and the only company is that of the terns, noddies and gannets, which come to nest in thousands. (The birds return for egg-laying at the same time each year, within a day or so of the same date, year after year). Amateur radio enables the operators to obtain news of their friends and relatives and it is the pleasing duty of VK2YK to handle such news, weekly. The transmitter at VK4SK is a TPTG using about 100 watts to a DET 1 tube. The power supply consists of a petrol driven generator and the QRI is a typical 500 cycle note as used by shortwave marine stations. Work is done on the 3.5, 7, and 14 MHz bands and American listeners would do well to watch for this station on 7 MHz each Wednesday at 7.15 pm Sydney time and on 14 MHz at 1.45 pm on the first and third Sunday of each month, throughout the year.

The island is surrounded by a coral reef, is 22 feet above sea-level and has a shark-proof bathing enclosure constructed by the operators. Spare time is spent studying, playing golf with sticks and tennis balls and in swimming. As the temperature averages about 80 degrees, the latter is very popular and Willis Island fashions generally consist of shorts and singlets with perhaps a beard if the wearer prefers it to shaving.

How would you like to pound brass at an amateur station like this? No local QRM or background noise! Look for VK4SK and work the world's loneliest amateur station.

—Written by Roy E Abbott VK2YK and published in *QST* August 1932

(The January 1985 issue of *Amateur Radio* magazine advises that Willis Island is currently being activated by VK9ZR on all bands including six metres. Information about the transmitting times can be obtained from Jill VK6YL, who also handles QSLs).

WAVELENGTH, FREQUENCY AND LC VALUE CHART

Back in the middle of the 20s, 'wireless' was booming and hundreds of people built their own receivers. The term *wavelength was more* commonly used than *frequency* and ascertaining the value of capacity and inductance to tune a required wavelength — let alone understanding the 'Q' of a tuned circuit — was a giant calculation for many. To assist people with the necessary calculations the chart illustrated here was published in the magazine *Science and Invention* April 1926 issue. This magazine, edited by the famous author and experimenter, Hugo Gernsback, had combined with an earlier magazine by the same editor, *The Electrical Experimenter*. Later on, these publications became known as *Radio News*, but perhaps that is another story.

In the aforementioned issue of *Science and Invention* was a column known as 'Radio Oracle' which was a department of the publication's operation. This chart was the answer to a correspondent's question. It is a unique chart in that it includes the value of the product of LC, obtained by multiplying the inductance of a coil in microhenrys by the capacity of a shunt condenser in microfarads.

To give a typical example, suppose we have a nice condenser in the shack with a maximum value of .0005 μF and we desire to obtain the inductance of a coil which will tune to 160 metres (1.875 MHz). Referring to the table, we find that the LC value for 160 metres is .007204. Dividing this by the maximum capacity of the condenser (.0005 μF), we find that the coil to be used with this particular condenser should have an inductance of 14.408 microhenrys. Now, 60 years later, it could still be a useful chart for use in the DC bands. All you really need to know is the maximum capacity of that variable condenser in the junk box.

Chart for Determining the Wave-length, Frequency and LC Value for Radio Frequency Circuits

(L is in microhenries and C in microfarads.)

Wave Length (Meters)	Frequency (Kilocycles)	LC Value	Wave Length (Meters)	Frequency (Kilocycles)	LC Value	Wave Length (Meters)	Frequency (Kilocycles)	LC Value
10	30,000.00	.0000282	65	4,615.00	.001188	230	1,304.00	.01489
11	27,273.00	.0000340	70	4 286.00	.001378	235	1,277.00	.01555
12	25,000.00	.0000405	75	4,000.00	.001583	240	1,250.00	.01622
13	23,076.00	.0000476	80	3,750.00	.001801	245	1,255.00	.01690
14	21,426.00	.0000552	85	3,529.00	.002034	250	1,200.00	.01760
15	20,000.00	.0000634	90	3,333.00	.002280	255	1,177.00	.01831
16	18,748.00	.0000720	95	3,158.00	.002541	260	1,154.00	.01903
17	17,646.00	.0000813	100	3,000.00	.002816	265	1 132.00	.01977
18	16,667.00	.0000912	105	2,857.00	.003105	270	1,111.00	.02052
19	15,788.00	.0001016	110	2,727.00	.003404	275	1.091.00	.02129
20	15,000.00	.0001126	115	2,609.00	.003721	280	1,071.00	.02207
21	14,284.00	.0001241	120	2,500.00	.004052	290	1,034.50	.02366
22	13,635.00	.0001362	125	2,400.00	.004397	295	1,017.00	.02450
23	13,042.00	.0001489	130	2,308.00	.004757	300	1,000.00	.02533
24	12 500.00	.0001622	135	2,222.00	.005130	310	967.70	.02705
25	12,000.00	.0001755	140	2,144.00	.005518	320	937.50	.02883
26	11,538.00	.0001903	145	2,069.00	.005919	330	909.10	.03066
27	11,110.00	.0002052	150	2,000.00	.006335	340	882.40	.03255
28	10.713.00	.0002207	155	1,935.00	.006760	350	857.10	.03448
29	10,343.00	.0002366	160	1.875.00	.007204	360	833.30	.03648
30	10,000.00	.0002533	165	1 818.00	.007662	370	810.80	.03854
32	9,374.00	.0002883	170	1,765.00	.008134	380	789.50	.04065
34	8,823.00	.0003255	175	1,714.00	.008620	390	769.20	.04277
36	8,333.00	.0003648	180	1,667.00	.009120	400	750.00	.04503
38	7,894.00	.0004065	185	1,622.00	.009634	410	731.70	.04733
40	7,500.00	.0004503	190	1,579.00	.01016	420	714.30	.04966
42	7,143.00	.0004966	195	1,538.00	.01071	430	697.70	.05204
44	6,818.00	.0005446	200	1,500.00	.01126	440	681.80	.05446
46	6,522.00	.0005960	205	1,463.00	.01183	450	666.70	.05700
48	6,250.00	.0006485	210	1,429.00	.01241	460	652.20	.05960
50	6,000.00	.000704	215	1.395.00	.01301	470	638.30	.06219
55	5,454.00	.000852	220	1,364.00	.01362	480	625.00	.06485
60	5,000.00	.001014	225	1,333.00	.01425	490	612.20	.06759
						500	600.00	.07039

The chart for determining wave-length, frequency and LC values often comes in handy for use in various radio calculations. Clip this table out and keep it for reference.

Table 1.

TECHNICAL MAILBOX

DC POLARISATION PROTECTION FOR MOBILE RIGS

Bob Geeves VK7KZ, of Hobart, has provided insight into consumer products where the customer is always right, but the electronic evidence provides conclusive evidence that it was not the case.

Bob provides a simple modification carried out on a CB rig that forces the user to *get it right!*

Here is Bob's suggestion, noting that it is only applicable for equipment that does not have the negative supply connected directly to the equipment case.

Most readers will be aware that the DC input circuits of most CBs, mobile amateur rigs, marine electronics, etc have reverse polarity protection in the form of a diode across it to cause the fuse to blow if connected incorrectly.

In my experience, over many years of servicing such equipment, the most common fault is just that.

Whether it has been that the battery has been taken out and replaced in a vehicle the wrong way around (yes, some people even open up the negative terminal and squeeze the positive to fit! !), sheer ignorance of what red and black means, the more frequent use of two red leads, one with a black trace along it causing confusion, it happens regularly.

I had a case some years ago where a unit came in smelling badly of burnt wiring. On inspection, it was found that it had an unblown 35 amp fuse in the power line, the polarity protect diode had melted in half, the power leads inside the set had been on the verge of fire, and tracks on the PCB had changed colour.

This was a typical case of the wrong polarity. The diode had caused the original two amp fuse to blow. The customer replaced it with one size bigger and tried again. The diode by this stage was dead-short, so it blew the second fuse. A 35 amp fuse was installed, the power hooked up again, and "smoke appeared from inside the set with funny crinkly sounds."

Time to take it to the doctor.

I repaired the unit and told the customer that it had been put on the power back-to-front.

I also explained that it would have been worse if he had switched the set on, because luckily the protection diode was before the ON-OFF switch, so the reverse polarity did not get to the rest of the set.

Next day, back it came. The customer was extremely angry having to bring it all the way back from the country.

Sure enough, same problem. I fixed it again and told him *once again* it was connected back-to-front, and to please check which is positive and which is negative.

A newly educated customer left happily, I hoped, as I only charged for the new diode — no labour.

The next day he was back! "Same thing happened — b. . . y fuse blew, but I did not try any more and I checked the polarity thing!"

I thought I would be smart and put a diode in series with the positive power input before the protect diode. At least it would not go if reversed, and would not do any damage. Away he went after I proved to him that it worked.

Next day he was back again! "The fuse didn't blow, but it won't go at all when you switch it on!"

This is when I decided to install a bridge rectifier in the power input, so it would not matter which way the power was applied and the set would still work. The set worked okay the next day so I had a happy customer (with a weird vehicle). He rang to give me the good news.

I have used this method regularly since that memorable week, and the hassle of arguing with customers has vanished. I would recommend it to anyone who has any electronic equipment that is connected and disconnected regularly for a DC source, as it can save a lot of heartache.

The choice of the bridge will depend on current drain of equipment. Five amps would be suitable for some car radios, small echo sounders, CBs and cassettes. *(Be warned however, that this is only applicable when the negative lead is not connected to the case — Tech Ed).* For larger current equipment, a 35 amp bridge could be used, but be sure to bolt them to somewhere suitable for heat transfer.

The power input goes to the normal AC input to the bridge, and outputs from +ve to switch, -ve to -ve rail.

(The protection diode is now somewhat superfluous with Bob's modification, but, of course, it can be left in as a "belt and braces" approach — Tech Ed).

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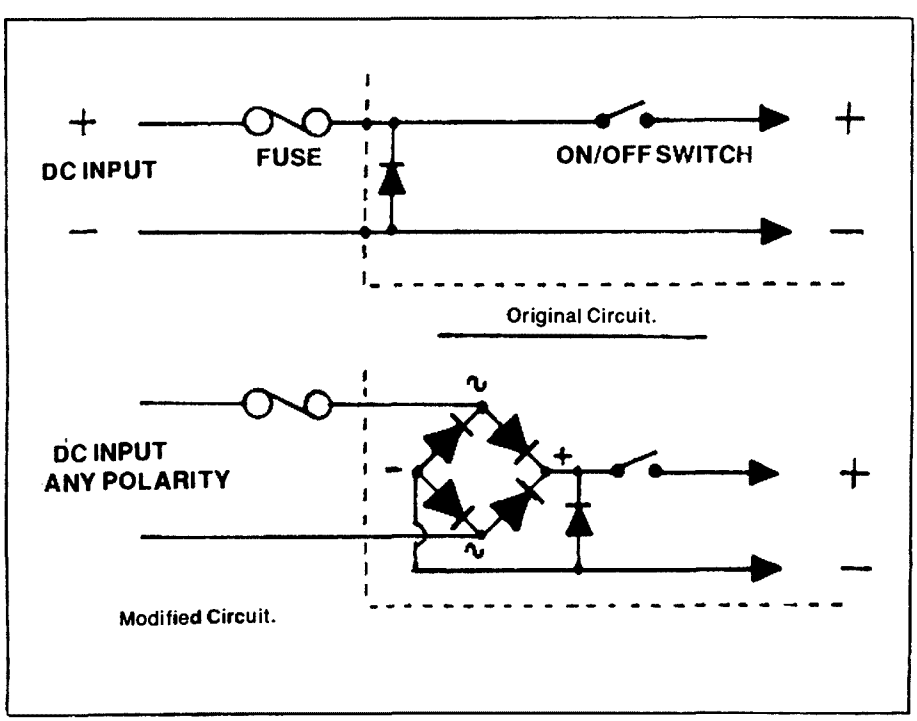

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED RECENTLY

DXCC

PHONE

349	Ken Watson VK2CKW
350	Ian Thomas VK3DNC

CW

127	Ian Thomas VK3DNC

VHFCC — 52 MHz

118	J A Roberts VK1ZAR

WAVKCA

1501	Jim Takamatsu JF2FMP
1502	Nicholas E Moon ZS6BBY
1503	Nariaki Murasato JH6CDI
1504	Osamu Kobayashi JH3CBN

WIA 75 AWARD UPDATES

Certificate No 680 — Made Aryasa HC3HIB
Certificate No 681 — Zenon Pietrzak SP6FER

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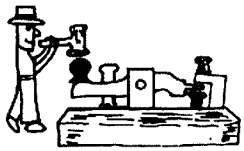
PERMANENT AMATEUR IN SPACE? ? ?

Representatives of NASA, AMSAT and ARRL met recently to initiate a long-term program which could lead to amateur radio literally being built into the NASA Space Station.

A working group was formed to develop the basis for a plan which would lead to a formal proposal to NASA during 1987.

—Abridged from *The ARRL Letter* September 29, 1986.



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

Before going on to the general business for the month, it is with a great deal of regret that I must advise readers that this will be my last column for some time. There are a number of reasons for seeking a "leave of absence," not least of which is the conviction that it is time for someone else to take over and bring a breath of fresh air to the column. Arrangements are not final as I write this, but it is my sincere hope that someone else, who feels as strongly as I do that CW deserves to survive and that its operators need a voice in *Amateur Radio,* will take up the challenge.

It has been a great deal of fun, and an education, writing *Pounding Brass* over the last four and a half years. The column began because there was a lack of material for CW operators in the radio publications at the time, and I felt that newcomers to the hobby needed to be provided with some assistance and encouragement so that they might become good, effective and enthusiastic CW operators. Judging from correspondence received over the years, I am proud to say that the original aims of the column have, by and large, been met.

Through correspondence generated by *Pounding Brass* I have made many friends with similar interests in CW and without whom the column would not have survived as long as it has. My thanks to all of you, and I hope you will offer a similar level of support to my successor.

Under the heading of "tidying up loose ends," you might recall that in the June edition of this column there was a suggestion that a "shoot- out" would prove that CW message handling is faster than phone. Readers were invited to take up the challenge and, if enough interest was shown, a formal event was to have been organised. Well, the good news is that a number of readers were willing to have a go! The bad news (depending on how you look at it) was that those who responded did not include a single phone operator. I therefore declare CW to be the winner by default!

Bill VK2MUS, wrote recently describing his early days as a telegraphist, and I found it very interesting reading:

"It seems strange to read of the many computer programs and similar schemes for learning Morse these days. As a telegraph messenger in a country town you were given a copy of the Code, access to a practice set and hopefully the postmaster or postal clerk could find time to give you some receiving practice. If you passed the test, your tutor received a bonus of £12.

"There was no classroom-type training until after WWII for Post Office staff. Full time telegraphists went to the Telegraphists-in-Training Class, in Sydney for training in machine systems but had to be qualified in Morse before being accepted. Country Morse tests were conducted over actual lines from the CTO in Sydney and involved sending and receiving something like 40 telegrams — rather different to the few words of the DOC test.

"Most of the smaller country Post Offices shared a line with several other offices, each having its own call sign. I started work at Culcairn (CC) and other offices on that line were The Rock (HG), Henty (HJ), Walla Walla (WP), Balldale (AS), Corowa (CW), and sometimes Oaklands (OD). The line was controlled by the Sydney telegraphist who worked each office in turn.

"The circuit was voice frequency from Sydney to Wagga Wagga with single wire physical line from Wagga Wagga to the end of the line, with earth return. If the line went open circuit on the country side of an office, contact could be re-established by putting that side to earth. Signals were virtually tuned in on the adjustable relay, which operated the local sounder circuit. If the relay was out of adjustment it was possible for signals to be passing through an office without being heard. If adjustment was needed, the sending operator would be asked to 'WRITE PLS' and he would send something out of his head before being given 'GA' to commence transmission. It was usual to send 'TTS 5' and receive '5 OK' after five telegrams as it was possible to be 'sending to the wind' and have to repeat them.

"Cutting it up, as per the Spruhan poem (*Coming Round the Bend*) was only supposed to be used for press telegrams. There was an official list of abbreviations in the Postmaster's Instructions book. However, at busy offices, particularly on Saturday mornings, abbreviations were often used on greetings telegrams such as congratulatory, birthday or wedding messages. There were various ways of speeding things up. You were not too popular if you had to open the key on a fast operator to count the words for the word check at the end of the message. A common way of avoiding this was to put a double space (typing) every five words. If there were supposed to be, say 18 words and you finished with three on the end, there was no need to count. When you were part way through receiving a telegram you dropped another form into the typewriter so that it followed the first one around the platen — saved a second or two and a possible fumble when grabbing a form in a hurry! These things were necessary because some slick operators scarcely paused between telegrams. Although it was not allowed officially, some timed their messages off with their left hand while sending with the right. Timing off consisted of putting a batch number, line number, time of transmission, and initials. It takes quite a lot of skill to do both together."

Some of you may wonder what all this old-time telegraphy information has to do with amateur CW operation. Well, all I can say is it is our heritage. It is a very large part of how we came to be high-tech electronic brass pounders, and there is always something to be learned. For example, Bill's letter reminded me of an early exposure to amateur CW operation, where I saw someone sending with his right hand while logging with his left. Wish I could do it!

Some tricks of the trade are so natural that they are almost universal, such as continuously feeding forms into a typewriter (I used to do that with index cards when I was at uni). Radio operation tends to follow similar patterns around the world, partly because one instinctively tends to mimic ones peers, and partly because one deliberately remembers and tries to implement better ways of doing things. Amateurs around the world work with each other and develop for their own convenience standard ways of communicating. But I wonder how similar land-line telegraphy operations were in, say, rural Australia and rural America. For that matter, how did domestic telegraphy compare with international cable operations?

Since it has not been mentioned for some time, and there are probably many more of you out there who own IBM-PCs or clones, I would like to take this opportunity to remind you that I have developed a Morse training package to run on the PC. It has undergone considerable revision, and now, in addition to the keyboard echo feature, and generation of random practice groups and words, it now has the ability to send "speed words" and convert any text file on the PC to Morse code. Send a SASE for full details.

Tony G4FAI, has advised of a new international publication for Morse operators. It is called *Morsum Magnificat,* and is published in the Netherlands, with an English version edited by Tony. *Morsum Magnificat* is written by, and for, Morse addicts. The intention was to find and bring together the history, illustrations, anecdotes and adventures of Morse telegraphy, wire and wireless, to save them for posterity. *Morsum Magnificat* is published quarterly, and an annual subscription is $A13.

Send details and your remittance to Rinus Hellemons PA0BFN, Holleweg 187, 4623 XD Bergen op Zoom, Holland. Cash is preferred to cheques, but if you are wisely reluctant to send cash through the mail, you can send an international bank draft for £6, payable to "Morsum Magnificat" care of Tony Smith G4FAI, 1 Tash Place, New Southgate, London, N11 1PA, England. The efforts of these keen CW enthusiasts deserve support.

Tom VK4TL, mentioned a contact recently with a fellow who had not been able to "master a Morse key" but, as he was interested in the mode, he was using a stapler and a piece of wire. Tom says his signal formation was good, but as might be expected, there were a few break-downs.

Finally, Harrow VK3CHM, sent a clipping from *The Age,* August 19, 1885. Well, actually it was in the *Happening 100 years ago* column. It is worth quoting:

"The Postmaster-General has decided to introduce into the telegraphic service a system of prize medals and certificates for efficiency similar to that in force in America. The object is to foster an Interest in the study of telegraphy amongst the operators. The prizes will be divided into four classes. In the first class, a gold medal will be awarded to the best transmitter of messages, and a silver medal to the second best. Similar medals will be awarded to the best and second best receivers of messages. A special gold medal will be given to the operator who proves his superiority in every branch. The test examinations will take place about November. . . It is the intention of the Postmaster-General to also award a gold and silver medal for the best and second best essay on the progress of electrical science during the present year. . ."

What a clever idea! Of course, that was back in the days when initiative was rewarded, not taxed.

Thanks again for your attention and interest over the last few years. My very best wishes for an enjoyable holiday season, and 73 until next we meet.

mr

FRED READY TO HELP DISABLED

O An Australian microcomputer-based video training aid for the disabled, based on the television home computer and games concept, is now on the market.

It is called the friendly rehabilitation and education device (Fred). The basic design allows for control of the unit by two joysticks, but provision is made for tailor-made switching to suit special needs.

From inception, Fred was designed with the needs of the disabled in mind.

It is not a standard consumer product modified, but an aid for therapists and teachers who work with the disabled.

It produces colourful displays moving at graded speeds on any standard colour television receiver.

Program cartridges will offer a variety of games, educational packages and exercises, each with selectable levels of difficulty and skill.

—Condensed from *electronics news* September 1986

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

The West German electronics magazine *Funkschau* published in 1974-75 a number of papers on EMC technology. The aim was to inform the public about the need for electronic entertainment equipment and other appliances designed so that the equipment is immune (sufficiently selective) to legally transmitted signals from other services not meant for entertainment. These publications described:

- EMC television receiver front-end
- Selective antenna preamplifiers
- FTZ (DOC) testing methods (approval of manufactured and imported appliances)
- FTZ (DOC) EMC standards

They also included:

- Addresses and telephone numbers of 72 radio inspectors' offices
- Names, addresses and telephone numbers of 121 appliance manufacturers and importers who had offered to assist in EMC problem cases
- Filter designs and response curves from appliance producers and from several special filter manufacturers were also published.

All this work was done more than 10 years ago and the many technical problems solved, as the following publication shows:

***Funkschau*, No 24, 1974 by the late Egon Kock DL1HM**
translated by Hans Ruckert VK2AOU

RF Radiation-Immune Colour TV Front-end
Television sets may be affected (TVA) by unwanted RF radiation, which may be picked up by the television chassis, the television aerial, the mains power line or via the attached cables and appliances (VCR, Hi Fi equipment, computer etc).

The Immune TV Tuner
(A Grundig circuit, Figure 1, typical of 1974 West German design)
It is important that television front ends are equipped with a high-pass filter with 48 MHz cut-off frequency and input band-passes for television band I, band II and UHF The filter response should have a steep cut-off slope to protect the control electrode of the RF stage transistor. These, and sometimes needed add-on filters, work only as intended if the chassis earthing points have been correctly chosen (provided there is a metal chassis). It is also important that protective diodes, used against atmospheric discharges picked up by the antenna, are placed correctly to avoid rectification, modulation and production of harmonics. The circuit shows a shielded high-pass filter at the antenna terminal, which attenuates all unwanted signals below 40 MHz from short-, medium- and long-wave transmitters. Not all manufacturers do this. Consequently, the pin diodes Di-51, Di-52, Di-54 and the protective diodes Di-56 and Di-57 cannot cause interference. We find next a series tuned L-C trap with C-57, which is tuned to 145 MHz to suppress two metre amateur radio transmitter

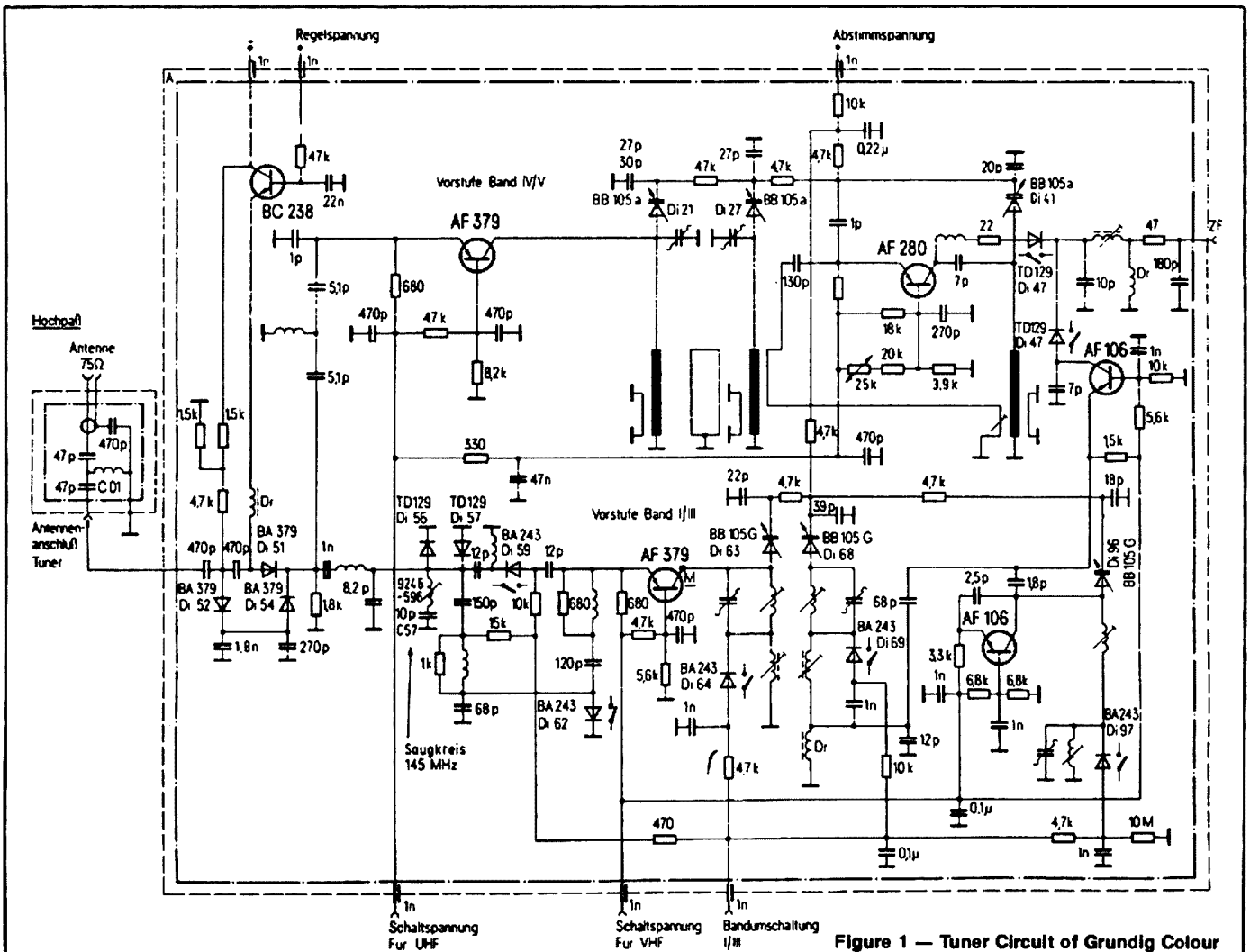


Figure 1 — Tuner Circuit of Grundig Colour Television Sot; 1974 design. High immunity against unwanted signals entering via the antenna.

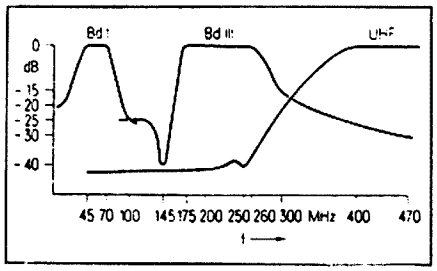


Figure 2 — Tuner Selectivity of Grundig Colour Television Set; design 1974.

signals. The passband filter, which is switched by diodes Di-59 and Di-62 (television band I and band III) has steep slopes to improve the selectivity by rejecting further out of band signals. Both tuner preamplifier stages use high current transistors AF-379, without gain control, which improve greatly the dynamic range of the preamplifier. They operate with constant operating conditions. A 100 mV input signal at the emitter causes only one percent cross modulation, but some popular transistors can only take 15-20 mV. Any remaining unwanted signals are further rejected by the following passband filters, which are tuned by capacitive diodes. Figure 2 shows the television front end selectivity achieved. It shows also the 30 dB dip caused by the 145 MHz trap. An easy to plug in additional high-pass filter with 48 MHz cut-off response is being made available, as also is a high-pass filter for above 175 MHz (if VHF band I is not used), to deal with extremely difficult cases.

Direct RF Pick-up by the Chassis Components and Leads

The most important step was the total shielding of the complete IF amplifier, to which the shielded tuner is connected via a short coaxial cable. It was also necessary to use ceramic feed-through capacitors to remove RF from the tuning voltage lines of the electronic tuning circuit. Of extreme importance was the selection of the correct earthing points for the various circuit groups and their connecting leads and coaxial cables, to avoid bypassing of the tuned circuits and filters.

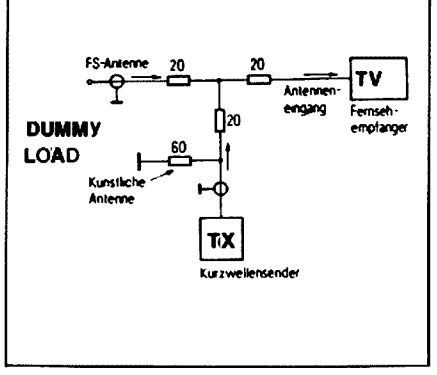


Figure 3 — Immunity Testing of a Colour Television Set on Amateur Bands with transceiver and Preamplifier as unwanted signal source. At up to 100 volts RMS level on 3.6 MHz, no TVA on Grundig Television Receiver.

Testing of Immunity at Radio Amateur Frequencies

Figure 3, Grundig method 1974-75. The transceiver FTDX-500 with the linear amplifier FL-2000B are connected to a 60 ohm dummy load. A 6 dB power splitter connects the transmitter output voltage to the television antenna terminal. The transmitter was single tone modulated on the 80 metre band, but there was no picture or sound interference despite the 100 volt RMS transmitter level.

Similar results were achieved using a ground plane transmitter antenna (a dipole for 80 metres) only 1.9 metres away from the television antenna, and the transmitter operating with maximum power on the 40, 20, 15 and 10 metres bands. With 600 watt ERP at 145 MHz and about seven metres antenna separation resulted also in TVA free operation.

EMC achievements of this degree obtained by Grundig and most other West German manufacturers were of course not only appreciated by radio amateurs and their neighbours. The radio inspectors of the postal department (FTZ/DOC), service departments of television manufacturers, and the service men of appliance dealers saved time and costly, often frustrating, jobs finding the cause of TVA (also TVI and ITV) while trying to improve the compatibility (selectivity, immunity) of television sets and other appliances or services. But there were fewer cases for the lawyers!

More recent development showed that with improvement of the chassis earthing point selection similar EMC values could be achieved with fewer components. Readers may compare this television circuit with that of their own television set circuit. The comparison may indicate why filters do not help and why they experience TVA. Caution: with most televisions it is not advisable to conduct the EMC test described above with 100 volts of amateur band RF at the antenna terminal. The television front end may "go up in smoke!"

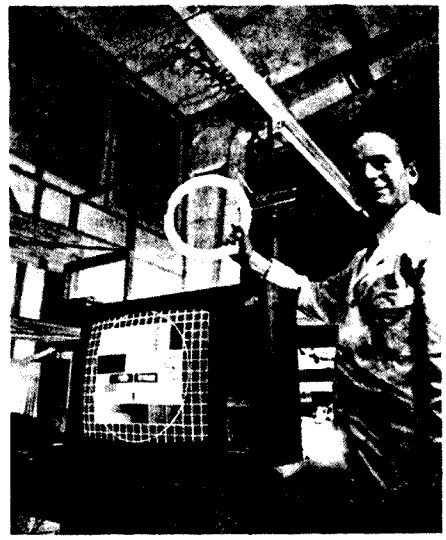


Figure 4 — The signal from an amateur radio transmitter is so strong above a Nord-Mende colour television set that a hand-held fluorescent light shines with full brightness. The amateur band beam and the television antenna are less than two metres apart and above the television set. No TVA results!

Several other West German companies also achieved very high immunity levels for their television chassis, avoiding RF pick-up by the chassis components and wiring. *CQ-DL* magazine 2/1978 (Figure 4) shows a Nord-Mende colour television set three metres underneath a mobile antenna and the RF field of a Heath SB-401 transmitter, with the television antenna nearby. The RF field was so strong, that a hand-held fluorescent light shone with full brightness! The next photograph shows the compact television chassis with individually shielded plug-in modules in the metal frame of the Nord-Mende colour television set. There are no unshielded hinged printed boards, acting like a receiver dipole, or wires going all over the place like an untidy bird's nest (Figure 5).

The problems still existing in DL are those millions of television and broadcasting receivers, which were manufactured and/or imported prior to the EMC efforts of the FTZ (DOC), the DARC, DIN (Standards) and VDE (Engineers' Associations) leading to the updated 1981 EMC Standards Law.

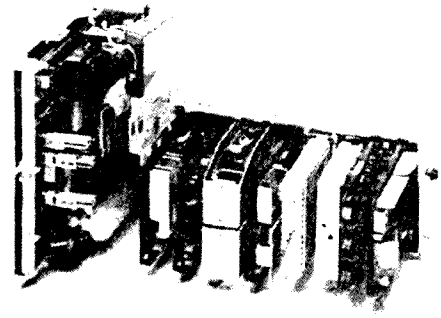


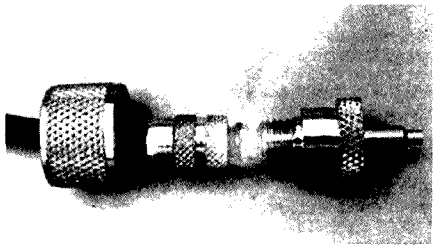
Figure 5 — The compact colour television chassis of a Nord-Mende receiver with individually shielded plug-in modules on a metal chassis. Correctly chosen earthing points and this shielding avoid RF pick-up by the chassis and leads. This results in a very high immunity level.

Even now some people are reportedly trying to bypass or to water-down the immunity standards. That is why DL9AH (*CQ-DL* 7/1986) recommends taking a two metre hand-held transmitter to the shop, if one intends to buy a television set or Hi Fi receiver amplifier. By holding the 1.5 watt rig close to the television set, etc one can get at least some idea of the immunity or lack of it. He describes also a small homemade 80 metre transmitter whip antenna and loading coil. By moving the antenna at 10-20 cm distance around a VCR, the one watt power from the transmitter shows clearly which VCR not to purchase. ***How popular would he be in our shops?***

ar

TEFLOCK CONNECTOR

Teflock PL259 connectors, marketed by Captain Communications, fills the need for a high quality UHF and HF connector for RG58 cable. Unlike older designs, the Teflock can be secured in seconds, without soldering or risk of shorting. The centre conductor can be crimped or soldered, enabling quick, easy fitting away from the workshop. The braid and outer sheath are held to the connector by the shield lock.



For the novice, or anyone who is not expert at making up cables, the Teflock is the only connector worth looking at. Its high temperature Teflon insulator will not surrender, even when attacked by monster soldering irons!

The Teflock is Australian designed and manufactured, is actually cheaper than imported PL259 plugs and is easily re-usable.

For further information and pricing contact David Gill, Captain Communications, 28 Parkes Street, Parramatta, phone (02) 633 4333.

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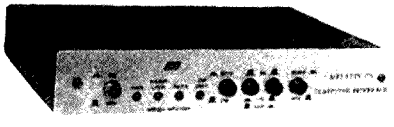
EASY RTTY ON A COMPUTER

The latest version of the MFJ-1224 RTTY/ASCII/AMTOR/CW computer modem is now available from GFS Electronics.

Designed to interface between a computer and radio transceiver or receiver, the unit will allow coupling of all the above modes when appropriate software is used. As supplied, it is ready to go to air on a C-64 or VIC-20 personal computer. CW/RTTY software and cabling is provided.



A unique features which enables readability in extremely noisy conditions is a sharp eight-pole active filter preceding the receive detector which serves to clean-up a bad signal before presenting it to the detector.

The modem copies on both mark and space-tone, not just mark-only or space- only. Tuning in a signal is made very easy with a special built-in two LED tuning indicator. A wide range of transmitter keying facilities are provided, along with TTL and current loop outputs to drive a mechanical RTTY machine.

For further information contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone (03) 873 3777.

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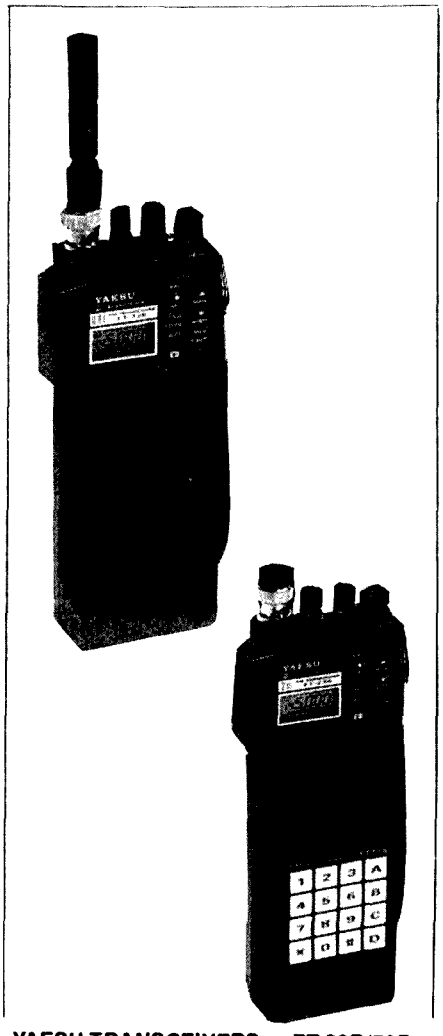
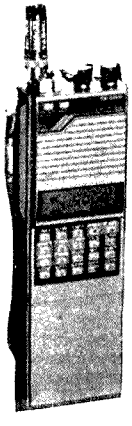


YAESU TRANSCEIVERS — FT-23R/73R; 727R & 767GX

The FT-23R and 73R are ultra-compact, microprocessor-controlled handies that offer the convenience of very small size and lightweight without limitations of features and performance.

Both units feature 10 memory channels which each store repeater shifts, busy channel and priority channel scanning, 1 MHz up/down stepping and a top panel rotary dial for memory and frequency selection. The LCD display includes a baragraph S/PO meter.

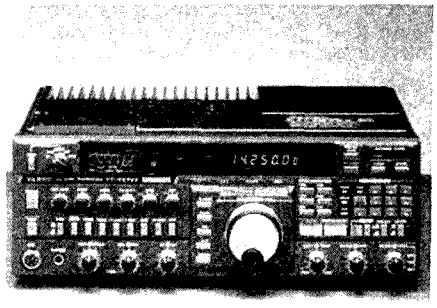
The FT-23R covers 144-146 or 144-148 MHz, whilst the FT-73R covers 430-440 or 440-450 MHz. A full range of accessories is available.



The FT-727R is a completely self-contained VHF/UHF FM hand portable transceiver providing up to five watts or 0.5 watts RF output on user-selectable channel steps across both the two metre and 70 cm FM amateur bands.

A full range of options are also available for the FT-727R.

The logically grouped controls on the FT-767GX make it easy to use, although on first appearances the unit's front panel is a mass of "whiz- bang" knobs and buttons. It is a HF/VHF/UHF all-mode transceiver.



The FT-767GX has through-chassis duct flow cooling which allows continuous key-down transmission for up to 30 minutes. No external heavy-duty power supply is required and the entire top half of the unit is diecast aluminium. A built-in automatic antenna tuner is incorporated in the unit: if the SWR exceeds 1.2:1 the tuner automatically rematches the antenna.

For further information and prices of these Yaesu transceivers contact Bail Electronic Services, PO Box 506, (or 38 Faithful Street), Wangaratta, Vic. 3677. Telephone (057) 21 6260.

THE MANUFACTURERS OF R.F. AEROSPACE, ANTENNA SYSTEMS WOULD LIKE TO THANK THE FOLLOWING PEOPLE AND COMPANIES THAT HAVE GIVEN INVALUABLE HELP AND ASSISTANCE IN THE DEVELOPMENT OF THE MOST SOPHISTICATED ANTENNA PRODUCTS AVAILABLE IN THE WORLD TODAY.

VK2SG

VK4JY **VK2XDE** **VK2ANS**

VK2EG VK2BNN VK2CDD VK2DAY VK2XKK VK2XS
VK2DUC VK2YBX VK2CBJ VK2XKJ VK2XRC VK2DLE/BN

CARL HOLDEN, MR GREG ACKMAN, MR PETER PRIDE, MR MARK SHAW
MR RON KINGSTON, MR ROBERT WILSON, MR JIM MILTON, MR FRANK KERMECI;

THE CSIRO, THE DEPARTMENT OF COMMUNICATIONS, MOBILE ONE PTY LTD, DICK SMITH ELECTRONICS PTY LTD, HAM RADIO OUTLET — USA, ANDREWS COMMUNICATIONS, ADVENTURE BROAD CASTING COMPANY, AUSLEC AUSTRALIA, ALCAN AUSTRALIA, THE UNIVERSITY OF NSW, HIGH TECH AUTO TOOLS PTY LTD, VK2AFS AND STAFF.

Club Corner

SYDNEY AMATEUR DIGITAL COMMUNICATIONS GROUP

The Sydney Amateur Digital Communications Group has been involved in the task of implementing the CCITT X.3 Terminal Interface Protocol (TIP) into the existing Amateur Packet Radio AX.25 Protocol. The SADCG is the first group in the world to do this, the Vancouver Amateur Digital Communications Group (VADCG) had implemented the X.3 TIP into the Vancouver Protocol.

The implementation of X.3 TIP into the AX.25 protocol puts Australia in the front line of worldwide amateur packet radio development, as up to now, the US and Canadian amateur radio groups have dominated development.

Currently, the AX.25/X.3 version is only available to users of VADCG Terminal Node Controllers (TNCs), but it is expected that TNC manufacturers will adopt the X.3 TIP standard, which will be commonly known as AX.3 TIP, as it features some extra commands that are only found in an amateur radio environment. The CCITT X.3 TIP recommendation is most commonly used in commercial packet systems.

—Contributed by Steven Blanche VK2KFJ, Secretary SADCG

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WESTERN ZONE

Western Zone WIA members are advised that the next Zone Meeting will be held at Lake Bolac, on Saturday, December 13, 1986.

—Contributed by Ray Curran VK3DQN, Secretary/Treasurer, Western Zone

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ST GEORGE AMATEUR RADIO SOCIETY

Over the last year, the St George Amateur Radio Society has been active both on and off the air.

In January 1986, the Society held its first two metre DX contest for the farthest simplex contact during the month. The joint winners were Bill VK2AGF, Warren VK2KGN, Lewis VK2LS, and Clive VK2DQE.

March saw the annual Alan Pettiford Memorial Auction with over $5000 of equipment, bits and pieces (and junk?) going under the hammer. Also in March, a number of club members set off to Mount Bindo, near Jenolan Caves, west of Sydney, to fix the club's DX repeater and to activate the club call sign VK2LE for the John Moyle Contest.

April saw the Annual General meeting with the only major change being Dion VK2PD, taking over from Alan VK2DQP, as President. Gordon VK2BGA, received the Viv Maidment Bequest Award for his talk called *When the Time Comes*, based on his work as an undertaker.

In June the club applied for and received the special call sign VK2IYP for the International Year of Peace (but, because of a typographical error, the call received was, in fact, VK21YPI). The call has been used quite a number of times including the Novice, St George 80 metre and Remembrance Day Contests.

The club held its second 80 metre contest in July, a four-hour free-for-all one Friday evening to help promote the club, the St George Award, and to get practice for the RD Contest. The winners for this year were Peter VK2EMU, Clive VK2DQE and Bill VK2AGF.

Phil VK2AXS, John VK2AUZ, and Geoff VK2SA, so much liked the idea that they decided to activate VK2IYP portable, at Mount Bindo for the RD Contest and managed over 350 contacts, but swore that next year they would go somewhere a little warmer (at least above freezing! ! !). About a dozen other club members were active in the contest.

September saw the renaming of the alternate auction as the *Bill Shakespeare Auction* in appreciation of the tireless work Bill VK2AGF has given to the club since it was formed in 1971, particularly with the auctions. Because of the increasing size of the auctions, it has been decided to change them from weekday evenings to a Saturday afternoon.

Now on the downhill run for the year, the club still has the Annual Dinners and Christmas Picnic to come before it all starts again in 1987.

The members of the St George Amateur Radio Society would like to wish everyone a Merry Christmas and a Happy New Year.

—Contributed by Peter O'Connell VK2EMU

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VICTORIAN DISABLED CITIZENS' AMATEUR RADIO GROUP — VK3APU

The radio club is in the process of a membership drive to get the operation of the club set up in the eastern suburbs of Melbourne. An invitation is extended to disabled people and people generally, to take an interest in amateur radio.

The club seeks new members to form a new committee to run the club under the support of the Victorian Disabled Citizens Association. The club requires a venue to be set up, close to rail transport and asks for suggestions as to where the club may be established. It must be noted that a suitable venue must have lockable security for the storage of club property under the Department of Communications rulings. The radio club has equipment ready for use immediately it has a venue, however it is in need of a full call licenced radio amateur to act as the club's nominee in accordance with regulations.

To bring these objectives to fruition, the club invites interested parties to come together at an agreed time and place to discuss matters relating to the club's functions.

Interested people may contact the club by writing to: Michael Byers, President, Victorian Disabled Citizens' Amateur Radio Group, PO Box 466, Ringwood, Vic. 3134, or telephone Michael Byers on 722 1645 or Kelvin Lee 391 6310.

The Disabled Radio Amateurs' Club has been operational for over 13 years and has achieved a great deal of success, it is therefore envisaged that the Victorian Disabled Citizens' Amateur Radio Group will achieve the same successes.

—Contributed by Kelvin Lee VK3ZSQ, Member of DRAC and VDCARG

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DEVIL NEWS from the North-West

There were 16 members and two visitors in attendance at the last meeting of the club. Apologies were received from VK7s ZAP, KH, RN, AX and Florian Biner, who is on a visit home to Switzerland. A warm welcome to new member, Gordon Par. Gordon is interested in the technical side of radio and micro-computers.

The business side of the meeting was dealt with swiftly and a very interesting evening of discussion followed. Final details were discussed for Camp Quality which will be held from December 8 to 14. It is pleasing to report that there is more than enough volunteers, and plenty of equipment in the way of radios and aerials has been loaned for the time required.

It was announced that an Amstrad Computer Group has started in the North- West and any owner interested is welcome to attend their meetings.

One of our newer members, who has been very active in the club as News Co- ordinator for the Branch since arriving from VK5, has left to live in VK1. Thank you Frank VK7ZFH, for all your help in the short time you were in Tasmania and best wishes to you and your family in the future.

There will be communications activity at Easter time at the Horse Trials. There has been a good response from members and it appears there is enough volunteers.

The Club Radio Room is almost ready for habitation, there is only the carpet to be laid, so volunteer help is sought.

ACTIVITIES WEEK FOR DEVONPORT HIGH SCHOOL — VK7DHS

Tony VK7AH, and his group had a very successful week. Activities included a tour of the Able Tasman Wireless Room and a demonstration of

From left: Andrew VK7ZHA and Andrew VK7ZAP.

Greg VK7ZBT, rests on Mount Duncan.

Andrew VK7ZAP and Tony VK7AX, attended the installation of the special communication repeater, VK7RAD, on Mount Duncan.

life-boat drill, a walk to the summit of Mount Duncan to the site of one of our repeaters, a display of Army radio and a field exercise in trucks and jeeps to witness radio demonstrations.

Tony thanks all who assisted with the activities, and especially to Jack VK7WJ, for his assistance with lectures and the amount of time he gave.

NORTH WEST ATV GROUP

The first meeting of the group was held on October 15, at the home of the group leader, Tony Bedelph VK7AX. There were 13 in attendance.

Tony said that is should be emphasised that this is not a "splinter group" to the Wireless Institute of Australia, and is to support the Institute as required.

The evening was spent discussing the group's plans and intentions, which include the promotion of ATV activities amongst amateur radio members in conjunction with other radio activities.

It is hoped to encourage activities and provide assistance to interested people, support and maintain VK7RTV and VK7RAE repeaters, encourage outdoor activities using portable video equipment, provide assistance to organisations requiring video taping, etc, reintroduce ATV broadcasts and to include the occasional social outing of the group.

—Contributed by Max Hardstaff VK7KY assisted by Tony Bedelph VK7AX, with photographs courtesy Jack Wright VK7WJ

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WIA, CENTRAL QUEENSLAND BRANCH

The Lions Clubs of Mount Archer and The Caves, in association with Broadcast Station 4RO and the

Lyle VK4ALD (with hat) and Robb VK4TKA.

The 20 and 40 metre dipoles for Leisurefest 1986.

Etna Creek Prison Farm, organised a Leisurefest 1986, from September 19-21, 1986.

The Wireless Institute of Australia, Central Queensland Branch, obtained a site in association with the Rockhampton/Fitzroy State Emergency Service.

The Station VK4WIR was operated on Sunday, September 21, 1986 from 2300 to 0700 UTC.

Various visiting stations from the Central Queensland District and Gary VK4PY, from Gympie, called in.

The station was operated with a FT-707 and TS-520 plus various two-metre equipment. Antennas for the day were 20 and 40 metre dipoles and a 15 metre whip.

Even with the close proximity to 4RO and other electrical devices, the station was able to make contact with the stations below.

VK4BMW Max	7.075 Mount Isa
VK4FNQ John	7.075
VK4RR Richie	7.110 Moranbah
VK3RC/BWI	7.130
VK6ART	14.106 Travellers Net
VK4PY Gary	2 metres Portable Gympie
VK4KX	2 metres Portable Gladstone
VK3TE Stan	14.140 Melbourne
VK2DEY Stan	7.086 Murwillumbah

VK4WIR also called into the net after the VK4 News Broadcast on the Sunday on 7 MHz.

All stations contacted will receive a VK4WIR QSL card with *Thanks/ No Return Card Required.*

For the day, a special information sheet, headed *Amateur Radio and You* was produced. This was handed out to all likely inquiries.

—Contributed by Nick Quigley VK4NFL

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CENTRAL COAST AMATEUR RADIO CLUB

All amateur radio operators, their families, friends and anyone interested in amateur radio, are invited to attend the Central Coast Amateur Radio Club's 30th Annual Field Day on Sunday, February 22, 1987 at the Showground, Showground Road, Gosford, NSW.

Events at the Field Day will include radio and non-radio events to cater for all the family.

The same catering arrangements as in 1986 will apply. You may bring a picnic lunch or purchase food from the Take-away Food Bar in the Showground. Tea and coffee will be available from 8 am to 5 pm (separate from the Food Bar) at no charge.

Accommodation is usually scarce on the Central Coast at Field Day time, and early booking is advised.

Morning trains departing Newcastle and Sydney and arriving at Gosford between 8.30 and 10.30 am, are met at Gosford Railway Station and a courtesy bus is provided to the Showground. For return transport in the afternoon, contact *Information* one hour before the departure time of the train.

The Field Day will be held whether the weather is wet or dry as there is plenty of shelter at the Showground.

Items for disposal must be booked in before 9.30 am on the day. Catalogue forms and lot numbers must be obtained in advance. Contact Bill Smith VK2TS, RMB 4525, Gosford, NSW. 2250 or phone (043) 74 1207 after hours, for forms and lot numbers. Late arrivals or equipment improperly tagged or catalogued may be refused. A commission is charged on all sales. Lot numbers and forms will be available at the Showground on Saturday afternoon, February 21, 1987.

Companies, persons, groups or clubs wishing to set up a table or display at the Field Day should contact the Central Coast ARC at PO Box 238, Gosford, NSW. 2250 before January 3, 1987. Any telephone inquiries may be made to John Pogson VK2DBC, on (043) 25 9352 between 8.30 am and 4.00 pm weekdays only.

The VK2 QSL Bureau will be in attendance. Bring your QSL cards for the "Calls Present" board.

For full program details write, enclosing a SASE to CCARC, PO Box 238, Gosford, NSW. 2250.

—John Pogson VK2DBC, for the CCARC Field Day Committee

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FCC PROPOSES. . .

The FCC has proposed authorising additional frequencies between 7.050-7.075 MHz for Novice and Technician operators in Alaska, Hawaii, Region 2 Pacific Insular Areas and the Caribbean Insular Areas.

—From *The ARRL Letter* October 13, 1986

SPECIAL EVENT CALL SIGN

In celebration of United Nations Day, 4U1UN, the UN HQ station In New York City, used the special call sign 4U41UN. This one-day-event was held on October 24, and 4U1UN counts as a separate DXCC country.

—From *The ARRL Letter* October 13, 1986

VK3 WIA Notes

NEW MEMBERS

A warm welcome is extended to the following new members of the VK3 Division, as at September 25, 1986.

Polonia Amateur Radio Club, VK3CRP; N Campbell VK3QX; Hans Eisink; C D H Longfield; John Melia VK3QD; Margaret Nally VK3QU; John Nissinen VK3YNN; Philip Pavey VK3BHN; School of Electronics Technology — RMIT, VK3COT; Keith Turner VK3CWT; Allan Bengtsson VK3PLI; and Ab Aziz Hassan VK3XNX.

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MORSE BEACON

A Morse code practice beacon, VK3RCW, is operating on 144.950 MHz and is located at Waverley in Melbourne's eastern suburbs.

It sends random groups of letters and figures at two speeds, 5 and 10 WPM. The 24-hour a day beacon should prove popular amongst those wanting to increase the code speed.

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G General ***C*** Constructional ***P*** Practical without detailed constructional information ***T*** Theoretical ***N*** Novice ***X*** Computer Program

SHORT WAVE MAGAZINE, June 1986 — Simple Sideband Part 1. ***(P N).***

RADIO COMMUNICATION, October 1986 — Measurements on VHF/UHF Front Ends ***(P N).*** Transmission Line as an Impedance Transformer ***(T).***

HAM RADIO, July 1986 — VHF/UHF Special Issue ***(G).*** Strip-lines ***(C).*** UHF Low Noise VCO ***(P).*** Using the Multimeter ***(N).***

CQ-TV No 135, August 1986 — TVRO Receiver ***(G).*** 1986 BATC Show ***(G).*** ATV Circuits and Ideas and General Information.

WHAT'S NEW IN ELECTRONICS, August 1986 — Description of the Recent Developments in Components, Test Equipment, Integrated Circuits, etc.

RADIO ELECTRONICS, May 1986 — Kirlian Photographs ***(G).*** Surface Mount Technology ***(G).*** Computer Digest Section included in the magazine.

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QSP

RADIO NAVIGATION SYSTEM on 432 in CANADA

CRRL has become concerned about a new radio navigation system operating from the west end of Lake Ontario on or about 432 MHz. The frequency assignment appears to be legal. Amateurs use the 430-450 MHz band on a secondary basis. However, the assignment appears to have been made without due regard for potential interference. The wideband nature of the system's signals threatens weak signal terrestrial and EME communications near 432 MHz and satellite communications near 435 MHz. Also, amateur signals could inadvertently interfere with the system, creating possible danger for ships that rely on it. CRRL is pursuing the matter closely.

—From *The ARRL Letter* October 13, 1986

Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT 2606

After a long absence, a special bumper issue of *Forward Bias* in time for Christmas.

1987 SUBSCRIPTIONS

At the September meeting, the members of the Division voted to keep the VK1 component of the fees at the same level as the previous two years — $9.50. Due to a steady increase in the number of members, and tight financial management, we are able to run against the general trend in the country and not increase charges.

WIA 75TH ANNIVERSARY MEDALLIONS

A little belated, but the following VK1 amateurs were awarded 75th Anniversary Medallions for their outstanding contribution to the advancement of amateur radio and the WIA.

VK1AOP	Ted Pearce
VK1DS	Peter Smith
VK1VP	Eddie Penikis
VK1ZAH	Dick Elliot
VK1TH	Ted Howell
VK1DA	Andrew Davis
VK1DG	Dennis Gibson
VK1EP	Eric Piraner
VK1GB	George Brzostowski
VK1TR	Ted Radclyffe
VK1UE	Richard Jenkins
VK1OK	Kevin Olds
VK1MX	Bill Maxwell
VK1KAL	Alan Hawes
VK1MM	Fred Robertson-Mudie
VK1ZJR	Ray Roche
VK1RH	Ron Henderson
	Brian Davis

Space precludes describing the many ways in which the above have served their fellow amateurs, but all have made significant contributions to our hobby, and rightly deserve our congratulations.

PACKET RADIO

At the time of writing, the VK1 Division was in the process of establishing a packet digipeater. The digipeater will be located on a fire tower in the Kowen Forest, a few kilometres to the east of the centre of Canberra. While technical details are not yet confirmed, the digipeater should operate on 147.575 MHz, using the call sign VK1RPC. Output power will be 25 watts, and should give good coverage to Canberra and the surrounding area.

The digipeater is built around the TAPR TNC unit, and supports the AX.25 protocol. In the future, a more ambitious installation may be installed, supporting a number of protocols, and forming part of a major packet radio network.

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VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

Firstly, may I wish all members a Happy and Merry Christmas. The holiday time of the year is a break for most of us.

The last broadcast for 1986 will be on Sunday, December 21. The first for 1987 will be January 11. The Divisional Office will close for a similar period, the exact dates will be notified later.

About the time you receive this issue of AR, many of the readers, mostly those who have been a member for some time, will be receiving their annual renewal notice. (Those who joined recently are billed in the month they joined). There has had to be a rise in the annual subscription. The Federal element has gone up by $2.50 and the Division by 50 cents. This is the first rise this decade in the Divisional component. The full member subscription for 1987 is $34.50, with associates $32.50. This still makes the VK2 Division the second lowest fee structure.

A vacancy occurred on Divisional Council when Mary Jane Douglas VK2CMJ, moved to the north-western part of the State. The position will be filled for the remainder of the Divisional Year by Arthur Outteridge VK2YE, who was the unsuccessful candidate in this year's election.

A reminder to the various office bearers and groups within the Division — the year for the Division ends on December 31. Any financial reports, etc must be submitted by this date. Reports from office bearers for the annual report should reach the President by mid-January.

There was a poor response to the bookings for the annual dinner scheduled in October and the event had to be postponed. May things have gone quiet in amateur radio? A check recently on the information sheets from affiliated clubs showed that out of 37 registered, 20 had not returned this year's information, despite having been sent two separate postings with the required forms during the year. Since then, a third form has been sent. One group had not responded to any posting since 1983! It is also noted that when a club has a change of office bearers, often there is no old paperwork handed on. The Divisional Office receives several calls from the new secretary of a group saying I have just taken on the job but I have no information, would the Division please send something out?

GOSFORD FIELD DAY

In *Club Corner* you will see information about the Central Coast Field Day, which is to be held on Sunday, February 22. This will be the 30th annual event on the Central Coast.

If you have an event coming up and wish publicity for it in AR, please give about *three* months warning by submitting copy. This will bring it to readers about a month before the event.

ROSS HULL VHF CONTEST

Can you support the event this year? If so, check the rules in November's AR and enter when you can. Most importantly — ***send in your log.***

PUBLICATIONS

A reminder that there are stocks of the current Call Book and most publications available from the Divisional Office. If your household is perplexed for a Christmas present for you, drop a hint that you would like a book. A list is available, upon request, from the Office. Telephone (02) 689 2417, Monday to Friday, 11 am to 2 pm or Wednesday 7-9 pm.

There will be limited copies of the International and USA Call Books and the 1987 ARRL Handbook arriving early in the new year. Cost is unknown until the shipment arrives.

Do you find it hard to catch up on the news? The Broadcast time-slots do not suit? You only hear about something days after it was on the Broadcast? And then the person telling you only half heard it or was told by someone else. Then maybe the answer is to check the recorded news summary available from Monday to Saturday on (02) 651 1489.

NEW MEMBERS

A welcome to the following new members for October.

J B Elsing Assoc, Bowral; J Hannema Assoc, Rose Bay; M J G Knorr Assoc, Unanderra; A M Love VK2EZF, Crows Nest; D R Moore VK2XAR, Leichhardt; S J Oldroyd VK2JSO, Concord; S J Rogers Assoc, Greystanes; G J Selwood Assoc, Orange; D J Stephen VK2POW, Mullumbimby; P J Turner VK2ZNK, West Ryde; I G Waite VK2MMW, Bingara; D A Waugh VK2JDW, Blacktown; D G G Lengronne VK2MAI, Lidcombe.

ar

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

To all amateurs in Australia and their families, may we, the amateurs of Queensland, wish each one of you, a very Merry Christmas and a Safe, Peaceful and Prosperous New Year.

GYMPIE GOLDFEST 1986

Held on Saturday, October 11, this first Gympie Hamfest was a huge success. The organising committee of the Gympie Amateur Radio Club can be well pleased with the interest shown in this event.

Some 200 or so amateurs and friends visited the venue, the Chatsworth Hall, a few kilometres north of Gympie. It was a great day for meeting old friends, looking at the displays, listening to lectures and seeing some demonstrations of state-of-the-art packet radio or taking part in fox hunts.

Amateurs came *from far* and wide and a quorum of Divisional Councillors were there. David Jerome VK4YAN, the Queensland Divisional President, was introduced to the gathering by Alan Gardner VK4BWG, to officially open this first Gympie Goldfest, but certainly not the last.

CENTRAL QUEENSLAND SIX METRE REPEATER

The planning for this repeater took a step further when the Queensland Council approved a recommendation from QTAC that a six metre repeater application be established in the Rockhampton — Gladstone area. The application was submitted by the Gladstone Amateur Radio Club, who were commended for their excellent presentation.

Now, all that remains is all the hard work involved in getting this repeater on the air. Rockhampton and Gladstone amateurs are co-operating in this project. Progress reports will be made as time goes by.

VISITING NORTH QUEENSLAND IN 1987?

If you are planning a trip into tropical Queensland in the new year, think about making it towards the end of September.

Why? That is when the North Queensland Convention will be held under the auspices of the Townsville Amateur Radio Club. It is held every two years and visitors are made very welcome. If you have not tried North Queensland hospitality, you haven't lived!

—Bud VK4QY

QUEENSLAND NETS

The North Queensland News Broadcast Net is held an Sunday nights at 8 pm on 3.605 MHz. Operator is Evelyn VK4EQ using the Club Call Sign, VK4WIT.

—Contributed by Jeanette Mann, Secretary, Townsville Amateur Radio Club

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

I was pleased to receive a letter from Graham VK7ZO, recently regarding my paragraph in October's AR about a home-brewing frequency on 3.579 MHz. Graham says he has recently built the Drew Diamond VK3XU FET4 Tx four watts VXO, and has obtained crystals for that frequency. At the time of writing to me, Graham had only had one contact, and that was with Bob Tester VK5MV, one of our well-known Slow-Morse Panel members, from Mount Gambier.

Dare I say, Graham, that maybe one reason for the lack of contacts was the fact that you have been sending CW at 20 WPM! The group who first promoted the Home-Brew Frequency-Idea were the Port Lincoln ARC, who at the time were tutoring groups of school children from Port Lincoln High School and St Joseph's College. These children were building their home-brew QRP rigs as part of the project, and although they were learning CW, I imagine most of them were only up to five words-per-minute for the Novice Licence. I know that their teachers in CW, Jack VK5AJK and John VK5AEP (both Slow-Morse Panel members), could handle that speed, but perhaps some of the students would be encouraged to answer something a little slower.

Anyway Graham, don't give up trying just yet, and perhaps those of you with higher power and commercial rigs could leave the frequency free if possible to give our home-brewers a spot to find each other. Your reward may not be in Heaven, but it will certainly be in encouraging experimenters and home- brewers, many of them young — a breed we are often told, that is dying out with the introduction of "Black Boxes."

Speaking of young experimenters, we gained some excellent PR on Channel 7's *State Affair* thanks to a segment that they did on Grant Willis VK5ZWI. At 15, Grant is the youngest ATVer in VK5, and possibly Australia, a very talented young man who looks like having a big future in electronics. We have already had the benefit of his experience when he helped John VK5EV, to set-up the ATV display at Marion Library. Congratulations Grant and thank you once again for that excellent piece of PR.

Keith Ring VK5KH, at Kapunda, recently donated a Panda rig to the WIA for use on 40 metres for the Sunday Morning Broadcasts, in AM. The main problem seemed to be finding somewhere to house it for the time being, as none of the current operators needed it immediately. Our thanks go to Ross Dow VK5KF for finding it a 'house-room' and to Marlene and Brian Austin VK5QO and VK5CA respectively, who received the 'hernias' transporting it. And, needless to say, many thanks to Keith for the donation.

As this will be the last issue for the year, I can't help looking back and marvelling at all the things that have been accomplished in this, our Jubilee Year. In fact, of course, it was more like 18 months, as we kicked- off our activities in the Renaissance Centre, with a week-long 'launch' in May of last year. Since then, VK5JSA has been heard rail-mobile across the Nullabor; from the Cape Willoughby Lighthouse and the *Philandra* maritime mobile — also maritime mobile in the *Twin Gulf Yachting Regatta* and from on board the *Failee*, and the Paddle Steamer *Industry*.

The *Trade Train* was a major activity which involved amateurs from all over the State and there were activities which were as wide spread and diverse as the opening of the *Horse Drawn Train* at Victor Harbour, and the viewing of *Halley's Comet* at Stockport. There were so many other activities which took place, and some that we planned which, unfortunately, did not come to fruition.

The one name that comes to mind when we talk of Jubilee 150 is Graham Horlin-Smith VK5AQZ, and we could not let the year end without thanking Graham for all the work that he has put into the role of Co-ordinator. Without his foresight and drive, many of our activities would never have got off the 'drawing-board' but let us not forget the many others who have shared some of the glory (and sometimes some of the blame), but without whom even Graham's ideas could not have happened. It is probably unfair to name some and not others, but three names do standout from the crowd.

Rowland VK5OU, who has been responsible for organising and sending out the J150 Awards; John VK5SJ, who set up special nets and spent hours on air giving out VK5 contacts (not to mention the *Marion Centenary Activities*); and Peter Koen who thought up a new slogan and painted signs for most of the major activities. To these and to all the hundreds more up and down the State — the VK5 Division says thanks.

. . . BUT WAIT! ! !

It isn't over yet. On December 28, 1986 (the actual day that we become 150 years old) Ken Westerman VK5AGW, and a group of Glenelg-based amateurs will be using the VK5JSA call sign, possibly for the last time, at the Old Gum Tree, Glenelg — the place where South Australia was first proclaimed a State by Governor Hindmarsh.

Do look out for Ken and Company, and do not miss out on what may be your last chance to work this very special call sign.

I would like to take this opportunity to wish all a very happy Christmas and a year of good propagation and low noise levels!

DIARY DATES

DECEMBER

9 Christmas Meeting at 8 pm. *Looking Back at Radio in SA — an Audio History* produced and presented by John Hampel VK5SJ and Gordon Welsh VK5KGS, with the help of Kevin Kitto and the Glen Lea Singers — Woodville Community Hall, 64C Woodville Road, Woodville (between Port Road and the Railway Line, on the right-hand side, before the Council Offices).
Bring your partner and also a plate of food. The WIA will provide chicken and salad platters, sausage rolls, pies and pasties, all drinks, etc.
Interstate and country members welcome.

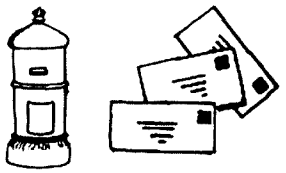
JANUARY

27 Traditionally a *Buy and Sell* night. *Please note* It is a fourth Tuesday, so excuse the OSL Bureau, Books and a short Business Meeting preceding the "Entertainment."

JSA AWARD WINNERS continued

628	W7DU	705	K4FSJ
629	VK2JWE	706	K1GZP
631	VK2AKU	707	KF5GA
632	ZL2BDF	708	KA6MBF
633	VK2EBX	709	KJ4BK
636	VK5IV	710	N2GOI
637	WB5MNV	711	N8GKR
639	VK3AUM	712	W5WJW
640	VK5ZPW	713	WOPUR
643	VK5KDD	714	WJ5H
645	VK6XV/M	715	KB6LBF
646	VK5NCM	716	N3ESS
647	VK5RK	717	KB5FC
653	WF5A	718	KI4BQ
654	WF KJB	719	KQ9Z
659	YB3CKY[1]	720	N3DLG
660	V55WS[2]	721	JA3GHA
661	JL3EQP	722	N6LHF
662	JG3QCW	723	KA9UVQ
663	W4RZN	724	WA5SWV
664	KA6OGC	725	VK2DET
665	WB6OHJ	726	VK5NTX
666	KA3DBN	728	K5HUT
667	KB2ON	729	WB2KSQ
668	KA2UFA	730	W2EKO/4
669	VE3HW/W6	731	WA3MEM
670	WW4Q	732	KA7VQX
671	NL7AT	733	K4BNX
672	K4DGV	734	KA5ZJA
673	VK5AX	735	N5GYT
674	NJ5L	736	KA0SRC
675	N9EOK	737	KD2KS
676	WA7GQA	738	N5EYT/3
677	W9BM	739	KA8MNS
678	KA1WZ	740	K1CLN
679	KA9CJC	741	N4MAD
680	V44KQ[3]	742	W2BIE
681	KA7YOG	743	WH6CWC
682	KA3LHP	744	WN6J
683	N4HXK	745	N4IBN
684	KA7MUW	746	KA0UWN
685	WA8URR	747	NM5N
686	KB6MJQ	748	N6JCS
687	K5ABD	749	G4MTC/W1
688	W Smith[4]	750	BRS 87801
689	KB6CGP	751	KA1EZR
690	AA4HX	752	KD2HQ
691	KA9VAC	753	KJ4VQ
692	KA4DME	754	WD8ECM/M
693	KB4HAH	755	G4VOE[5]
694	NH6FU/KH9[6]	756	JA3BOA
695	N0GLO	757	JE2ZXX
696	WD4OSS	758	VK5KAK
697	KA5ZIT	759	KA7SKE
698	KA3PIT	760	VE7FWF
699	KA3NCJ	761	G3NOF
700	N9EZF	762	WD4KCW
701	KA0GGQ	763	9Y4RJS
702	WB9HPR	764	HB9VQ[7]
703	KD5WR	765	DL2RBK[8]
704	WB9ZOP	766	JH1ROJ

1. First Indonesia
2. First Brunei
3. First St Kitts
4. Canadian SWL
5. First England
6. First Wake Island
7. First Switzerland
8. First Germany



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

HAMADS

I can attest to the "pulling" power of Hamads, inasmuch that I received the first reply to my advertisement in September's magazine, on September 5. The chap asked for 48 hours to consider but I told him that it was first come, first served. Anyway, next day another customer.

The first person came within 24 hours, discussed the equipment, and swapped some cash my way! From then on an irregular series of others were in contact, the last on September 25.

In view of this success I will use Hamads again (this month, in fact)!

I was most impressed with the October issue of *Amateur Radio* and would like to congratulate all concerned with the edition and the many who contributed articles.

Yours faithfully,

R Easterbrock VK3RM,
c/- Eliza Lodge,
347 Nepean Highway,
Frankston, Vic. 3199.
ar

TRAFFIC SYSTEM

The Mexico, now El Salvador earthquakes have highlighted these ideas.

I would suggest some close liaison in the USA between the Pacific Area Net (PAN) and Eastern Area Net (EAN), so the the National Traffic System (NTS) can respond to changing propagation from week to week. During the Mexico and El Salvador earthquakes, propagation changes seriously affected Australia's link to these areas via the two international traffic nets — International Assistance and Traffic Net (IATN), which feeds EAN and Australian-American Traffic Net (AATN) which feeds PAN.

This would develop an International Emergency Communication preparedness arm within the NTS.

Such an international co-ordinator/s based in the USA could:

1 Send directives needed to re-route international traffic through NTS in accordance to the propagation feedback received from the EAN and PAN international arms.
Comment: It would be nice *if propagation* were constant to Australia. This idea attempts a solution to the problem of long international links.

2 Use the expertise developed on the international traffic nets normally feeding EAN and PAN by sending a directive that they establish links to any part of the world affected by a disaster.

3 When any disaster occurs world-wide, to contact the US administration and foreign consulate to seek immediate verbal authority to handle Third Party Traffic to that country.

4 To expand during any disaster anywhere, the normal international schedules with Australia who depend almost totally on relaying their disaster welfare traffic via stations in the USA (600 messages to Mexico and 200 to El Salvador). This includes activating standby emergency schedule 0800 UTC, 7.228 MHz ±QRM, especially set up when contact is lost on 14 MHz to the USA.

5 To send a directive to Australia, that traffic capabilities to a specific disaster area, not normally covered by the 40 USA Third Party Agreements, exist so that amateurs in Australia can let the public know that amateur radio has a capability to handle their welfare inquiries.
Comment: Australian amateurs can pass traffic to any country the USA has an agreement with, provided we do it via a US or Canadian station. We now also have an agreement with Israel; ie currently we only have three direct traffic agreements.

Yours faithfully,

Sam Voron VK2BVS,
Co-ordinator ATN,
2 Griffith Avenue,
Roseville, NSW. 2069.

COUPLE OF THINGS WRONG

The April issue of *Amateur Radio* with its striking cover just came into my possession, or I would have commented earlier.

On page 31 is the following note:

> The ARRL has refused an FCC proposal that would turn the 52-54 MHz portion of the six metre band over to non-amateur computer enthusiasts who would use it for data exchange.

There are a couple of things wrong with this. First of all, this is not an "FCC proposal." It is simply a petition for rule-making, originating from outside the Commission, on which the FCC has taken no position at all. In accordance with the Administrative Procedure Act, the US legislation which among other things guarantees the right of public participation in the rule-making proceedings of executive agencies, the FCC has simply established a file number for the proposal and made it known that the public may comment on it.

ARRL has done so, and of course our comments oppose the proposal. With any luck, the Commission will simply deny the petition and terminate the proceeding since there are serious technical flaws in it. Should the Commission wish to seek further comment it may do so either by issuing a Notice of Inquiry, or by going one step farther and issuing a Notice of Proposed Rule-making in which specific new rules would be proposed. It is only the last option which could correctly be characterised as an "FCC proposal." In the case of either an NOI or an NPRM, there would be an additional opportunity for opposing comment by ARRL and others.

The second problem that I have with the brief item is that it conveys that ARRL has the power to "refuse" proposals which impact the amateur service. I wish this were true! The fact is that, while ARRL has considerable influence with FCC, the Commission is under no obligation to follow our desires. This is one reason why we are so anxious that amateur radio speak with one voice to the FCC — that of the League — just as you would wish the representative voice of Australian amateurs with the Department of Communications to be the WIA.

I completely understand the difficulty any editor faces in condensing a complex issue into a few words, and hope these comments will be accepted in the constructive spirit in which they are intended.

73,
Sincerely,

David Sumner K1ZZ,
Executive Vice-President,
The American Radio Relay League, Inc,
Newington,
Connecticut. USA.
ar

DE-SEXING ENGLISH

In reference to the Editor's Comment, October AR and the use of "draftsperson" instead of "draftsman" or "draftor."

The present cumbersome attempt to de-sex English is hilarious!

Consider using "Chairperson" and "Spokesperson" for chairman and spokesman when all authoritative dictionaries define both these latter words as a "person who etc."

Such stupidity makes "woperson" of woman and "feperson" of female!

But why "person"? — "per" (by means of) and "son" (equally male as "man").

With Leader, Stenographer, Laborer, etc as precedents, was it too logical, simple and consistent for the woperson de-sexers to use "Chairer" and "Speaker for"?

Errol Chick VK3GG,
15 Vida Street,
Eaaendon, Vic. 3040.
ar

TELEVISION

I was pleased to read the correction in the Editorial, and the information from *Wireless World*. 1936, via VK3ZXU, given in the October edition of *Amateur Radio* concerning the Inauguration of regular experimental television transmissions from Alexandra Palace, in November 1936.

I would like give further information showing that this was not the beginning of the transmissions from Alexandra Palace.

In 1935, I was a school-boy at a boarding school in Hertfordshire, gleefully absorbing wireless information from the magazine *Hobbies*. Another boy (H O D Thwaites) and I built three valve radios and later shortwave adaptors to plug into the detector valve sockets so that we could become shortwave listeners on the amateur bands. In the same year we formed a wireless club and built a 32 definition crude scanning disc television receiver. I wrote to Alexandra Palace to say that I had observed a face through the magnifying glass — the image coming through the spiral of 32 holes in the synchronous motor driven scanning disc from the photo-electric cell behind.

A nice letter came back saying that if the headmaster gave his approval, we could become a Baird Television Monitoring Station. This approval was given, and along came a beautifully made 32 definition Baird Mirror Drum television receiver, which we used to send a monthly log to Alexandra Palace.

In 1937 or 1938, after I left school, I remember watching programs on an all-electronic 405 definition Marconi-EMI receiver at the home of an engineer friend of my father. All transmission stopped, of course, at the beginning of World War II.

One last item of note — after being a SWL and electricity supply engineer for most of my life, I nobly failed the novice theory examination in 1981, but passed in 1982. There must be a message in that!

73,

Geoff Wallace VK4VLI,
8 Orana Street,
Victoria Point, Qld. 4163.
ar

A CRY FROM THE CROWD

Please hear a cry from one of the crowd of frustrated home- brewers in VK-land.

New black-box equipment prices are said to have nearly doubled in the last 12 or so months. Even quite simple pieces of amateur radio equipment are offered at prices which, on consideration, seem high. Home-brewing is said to be the answer!

The amateur radio candidate and novice is often told about the joys of home-brewing, but unless they already have the parts, or can find them at the local electronics store, they are facing considerable difficulty. The older old-timers may have a stock of salvaged parts in the junk-box, but I would say that the novice usually has not.

Sometime ago I took it into my head to build a transmatch type ATU and to re-build a power supply for a hybrid rig which I had obtained in good order. Much effort went into getting enough high voltage capacitors for the filters, and as for bleed resistors of sufficient power ratings — what a laugh. The hunt for a filter choke was eventually successful. The rig, now being operational, at least as far as receiving goes, the transmatch is next.

In fact, the search for transmitting variables began nearly 12 months ago. Seeing advertisements for them in AR and other places, I telephoned, only to be told that they had been sold, even prior to my copy arriving in the mail.

On a recent visit to Brisbane, I telephoned all the likely, and some unlikely, suppliers in the *Yellow Pages*. Quite a number of them did not even know what I was talking about. Most of those that did know said; "There's no call for them," — but there must be a demand if the few second-hand ones on the market get snapped-up almost before being advertised.

Perhaps the frustrated home-brewers have become sick of being told; "There's no call for them," and have stopped asking for transmitting variables, roller inductors, ceramic wafer switches, power resistors, high inductance filter chokes and so forth.

Or perhaps the profit margins on them are not so great?

Now I can hear a few saying; "Why doesn't he build his own?" Few of us have the facilities or skill to build variable capacitors, but we can assemble them into working devices.

A recent Prime Minister said; "Life wasn't meant to be easy." Someone also said that it wasn't meant to be impossible either. So come on all you frustrated home-brewers, put a little pressure on your favourite electronics store for the parts you require but cannot obtain. Come on retailers, some of these things will sell quickly. Come on magazine editors, what about a *Where to get it!* section for homebrewers. It is no good publishing home-brew articles if readers cannot obtain the necessary parts.

Yours faithfully,

Ken England VK4JPE,
31 Morgan Street,
Rockhampton, Qld. 4700.
ar

REVIVE THE PAST TO BEAT RISING COSTS

The prospect of continuing price increases for 'black boxes' has been clearly indicated in the statements by major resellers in the October issue of AR.

The situation has developed into a sort of "abandon hope all ye who enter the ranks of amateur radio" syndrome. And we in Australia, having to face up to the politically declared "Banana Republic" image see little prospect of an immediate improvement.

So we must seek a strategy which will, for the time being at least, retain the interest of existing amateurs and appeal to prospective enthusiasts.

My embryo proposal has been discussed with a number of amateurs, both VK and DX, and has met with approval and encouragement. Perhaps many will consider it a backward step and condemn the thought as contrary to the advancement of the art.

My proposal is to set aside a portion of certain bands, say 2, 6, 10, 15 and 80 metres, for the use of low powered, low cost home-brew equipment. The band portions could even be part of the novice spectrum already allocated.

The scheme would enable fledglings to make their first flutter with home- brew gear on both AM and DSB. The components could readily be gleaned from discarded black and white television sets. Likewise, it would provide the old timer with the means to fire-up his nostalgia and revive a lot of memorabilia.

I, for one, will be an enthusiastic participant.

Sincerely,

Geoff Switzer VK2SR,
53 Turf Street,
Grafton, NSW. 2460.
ar

COCOS-KEELING

I am more than a little disappointed in the *How's DX?* editor's treatment of the article on Cocos-Keeling Islands in the October AR.

The story is full of holes, omissions and in fact does little to enlighten the reader about this amazing coral island. Further, the editor hardly touches on the main reasons for any DXer to be interested in the location, which would be, put simply, to make contact with it on his favourite band.

For some time now, I have held the belief that there is severe criticism and discrimination against those amateurs, who by their individuality and different pursuit, dare to set themselves apart from the so-called norms of amateur radio.

If you behave or do things in a different way, then you can expect to be ostracised by the mainstream. In this case, that mainstream would appear to be represented by the WIA and in particular, those in the "know" about DX and such things.

Further, if you do things in the accepted way then you are also accepted as a friend of the WIA or its DX chasers.

The Editor's "obvious" omissions in his story on Cocos are lamely excused by the statement "however it is impossible to list all operations from this area."

His weak attempt gives credit to the "accepted" operations and credits the reduction of Cocos on the world "most wanted list" to the operations of only three stations.

The itinerant nature of the RAAF visits to Cocos and the nature of VK9NYG's operation, confined to the Novice bands, did little to reduce Cocos on the world want list. Anyone who consults the lists from that era will confirm this argument. The only significant reduction in the want list on Cocos Islands occurred after the VK9YL/VK9YS operation in 1979 and VK9YM/YT in 1982; totals for both operations, 50 000 plus.

The message to non-conformists is loud and clear, between the lines. Fortunately, maybe only 12 000 people read the column and over four times that worked the island by way of a non-aligned DXpedition, just as they did when they worked Heard Island, but that's another story, just like the six metre operations from VK9Y and VK9X which netted 20 000 contacts and 25 countries. Try and find that in any WIA journal.

Steve Gregory VK3OT/9YT,
PO Box 622,
Hamilton, Vic. 3300.
ar

SETTING THE RECORD STRAIGHT

My attention has been drawn to an article in a United States magazine which stated that, following the opening of the 12 metre band for American use, the first DX contact was some 20 minutes or so later.

I would like to set the record straight, at least in our own magazine, by advising that the band was opened on June 22, 1985 at 0000 UTC and I was immediately in QSO with N6JFG, Los Angeles, and subsequently with other stations. We set up a calling channel on 24.950 MHz and this system remains in use. Brian K6STI, formerly of San Francisco, but now at Manhattan Beach, LA, maintains a regular listening watch, either side of 0000 UTC and I do the same at this end.

There are good openings and we have found that if the 15 metre band is anywhere near operational, then there is a good chance on 12 metres. It would be nice to have more participation by VKs on this WARC band.

Very 73,

Joe Ellis VK4AGL,
Burnside Road,
Nambour, Qld. 4560.
ar

OPERATION RALEIGH 1984-1988

An opportunity has arisen for amateurs to become associated with *Operation Raleigh* by offering assistance as may be required to the flagship *Sir Walter Raleigh* as she visits the various Australian ports. Proposed dates are — Brisbane November 26 to December 7; Sydney December 9 to 12; Melbourne December 15 to 26; and Fremantle January 3 1987.

The vessel is an ex-Hull Trawler of 1900 tonnes and has been converted for use as a support vessel for various phases of Operation Raleigh. The ship's Radio Officer, David Legge, is also a radio amateur (G3SYF), and has been allocated the call sign VK4SWR/MM and will use this call sign on the Australian coast. The call sign GB0SWR/MM is used when the vessel is at sea.

An additional radio amateur is normally welcomed on board as there is a requirement for a skillful, experienced man to undertake the servicing of any of the radio equipment used in the field, either on vehicles or boats, as required.

The amateur on board has the use of a FT757 and the unique opportunity of being able to make many DX contacts from *Sir Walter Raleigh* to other amateurs world-wide. It would be much appreciated if representatives from local radio clubs would visit the vessel whilst she is in their vicinity, to offer any assistance with technical service and/or the amateur communications. Any further information may be readily available per telephone (02) 477 6275 or from the undersigned.

Af Davis-Rice VK2AXR,
396 Pacific Highway Hostef,
Hornsby, NSW. 2077.
ar

RECENT MOOTING

I write this letter somewhat hesitantly, I have been an amateur for six years and prior to that I spent several years as a professional operator. In that time I have not perceived, until recently, a threat to the enjoyment of our hobby that I deemed serious enough to cause me to put pen to paper.

The threat to which I refer is the recent mooting by some, to have a further class of licence introduced, the emphasis of which would be on the technical side rather than operating ability; ie Technician Class, and it is my opinion that, if these moves were to succeed, it would be to the detriment of all except the few, who I have noticed, with professional links with the electronics industry and would therefore slot neatly into this class without further effort, particularly in the area of CW.

These persons would have us believe that the average operator would lose nothing through the introduction of this licence. I say rubbish. At present, and after years of study, I have, in my opinion, reached the zenith of amateur radio by having obtained an 'unlimited licence' and the only way I can see of introducing a further class of licence, with the privileges that go with it, is at the expense of others such as myself.

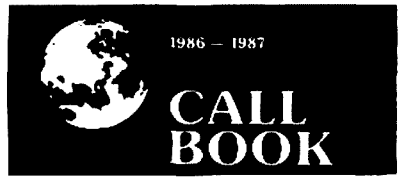
At the very least, I envisage a loss of a portion of the spectrum to these 'up market limited operators.' This type of licence will not open any further entry points into the hobby, as the present limited licence caters quite adequately for those having difficulty with CW and can only serve to create further divisions.

I would object to losing a portion of the HF band to under qualified operators. If their interest lies purely in the technical aspects of radio and not in sharpening their operating skills, it would be advantageous to both them and the rest of the hobby if they operated QRP into a dummy load, it would save power for them and spectrum space for the rest of us.

I urge all true operators to reject these proposals . . . outright.

Yours sincerely,

Ross Cummins VK2CRJ,
39 Hague Street,
Rutherford, NSW. 2320.
ar



Have you noticed any errors or omissions in the 1986/87 Call Book?

Please advise the WIA of any corrections as work has commenced on the 1987/88 edition.

Write to: PO Box 300, Caulfield South, Vic. 3162.

Please enclose information as in Call Book and corrected information!

Silent Keys

It is with deep regret we record the passing of —

MR P C ALDRED	VK4CA
MR A E BELL	VK3ABE
MR D E GARDNER	VK3PBJ
MR C J MARTINSON	VK3YSG
MR JACK C TURNER	VK2AJQ

Obituaries

STEWART D P SMITH VK4LA

Old-timer Stewart Smith VK4LA, became a Silent Key suddenly in the late evening of May 20, 1986. His passing leaves a noticeable gap among the many amateur operators who were proud to have called him their friend.

Stewart became a licensed operator on June 1, 1934, at which time he was a member of the Technical Staff of Radio Station 4BC, in Brisbane. He remained with the station until August 1941, when he joined the RAAF He later saw service in the United Kingdom, as a Wireless Navigator in 456 Squadron, RAAF and was mentioned in Despatches.

After the cessation of hostilities Stewart returned to Australia and soon after was appointed in charge of the Technical Section of the Visual Education Branch, in the Queensland Department of Education. He remained with the Department until his retirement in 1979.

He was a true "Foundation Member" of *Jamboree on the Air* in Australia, taking part as an amateur operator since its inception in 1958 and continued his association with every one of these events, as late as 1985. He was instrumental in arranging for the procuring of the first licence for a Scout or Guide Headquarters Amateur Radio Station in this country, when in 1964 he assisted the Queensland Branch Headquarters obtain its licence and call sign — VK4QH (now VK4SAA). He was the nominated Station Manager until he retired for health reasons a few years ago and for his services to the Association was awarded the gold "For Services Rendered" Badge, an award he wore with pride.

Even after his retirement as Station Manager, Stewart continued to maintain a keen interest in this station.

Stewart's final contribution to Radio Scouting and Guiding was in January 1986, when he offered his services, and was accepted, as Station Manager for the International Guide Camp Broadcast Station, operating out of their camp at Greenbank, in Queensland with the call letters 4NKN.

Stewart made many friends in Scouting and Guiding circles at all levels from Chief Commissioners, down to the boy and girl level, because of his friendliness and ever ready willingness to explain amateur radio fundamentals to keen Scouts and Guides. He was sadly missed in this year's JOTA.

He is survived by his wife, Brenda, daughter Jillian, son-in-law Lester, and devoted grandchildren, Kate and Stephen. He is sadly missed by them, as well as his friends in the amateur radio movement, Scouting and Guiding, all of whom valued his friendship so highly.

—Contributed by Noel Lynch VK4BNL and Jack Griffin VK4JG

JOHN B RYAN VK3AZA

It is with regret that I announce the death of John at the Caritas Christi Nursing Home, Melbourne, on October 3, 1986. John, aged 71 years, had spent most of the last 12 months in various hospitals receiving attention.

In the 1930s, John joined the State Electricity Commission of Victoria Electrical Laboratory, Yarraville. With the outbreak of World War II he joined the RAAF and, as a member of Aircrew, carried out many missions as a navigator.

With the cessation of hostilities, John returned to the SEC and, until his retirement, was actively engaged, as Design Engineer, in protection and stability studies associated with the system operation.

In the 1970s, John took out an amateur radio licence, thus making many overseas and Australian friends. John also gave a considerable amount of time as a volunteer worker in the running of the WIA Victorian Divisional Office.

John is survived by two sons, Daniel and Mark, and a daughter, Julie, who resides in California, USA.

On behalf of his amateur friends and myself, I wish to offer thanks for his friendship.

Reg Busch VK3LS

ar

MAURICE (MAURIE) PFEFFER VK4ANU

The untimely death of Maurie on September 30, 1986 robbed the Darling Downs Radio Club of one of its most enthusiastic members.

At the time of life when most hardworking and successful persons are considering retirement, Maurie turned his attention to amateur radio in 1980, and quickly progressed to his full call.

His dedication to the hobby was shown by his faithful attendance at executive and club meetings. This necessitated a round trip of 200 km from his agricultural property, sometimes twice a month.

He served his fellow amateurs with regular participation in many club nets and as net controller his big signal was heard far and wide.

In common with all other discerning operators, he devoted many hours to home-brew antennas and his many friends followed, with great interest, his persistent attempts to defy the law of gravity and keep his giant three-band quad airborne.

Two more of his many talents were directed towards the Brass Band and he was a foundation member of the Pistol Club.

Despite extensive chemotherapy and radium treatment, his health continued to decline.

A very close family man, Maurie will be sadly missed by his wife Melba, their children and their families, and his many, many radio friends, including the members of the VK4 Disabled Persons Radio Club (VK4BTB).

Maurie's attitude towards this Club was one of interest, companionship and concern. His able support could always be relied upon during Club activities and he rarely missed the weekly net on 80 metres.

Maurie and Melba.

Even in times of severe illness, his cheery manner always brightened the day. He will be sorely missed.

Deepest sympathy is extended to Melba and family.

—Contributed by Eric Wisseman VK4ADA and Roley Norgaard VK4AOR, on behalf of the Darling Downs and the VK4 Disabled Persons Radio Clubs.

ar

BILL DOUGLAS VK3GA

Bill was a veteran of both World War I and World War II.

Enlisting for the first conflict at the age of 17 (having relinquished his position as a Junior Teacher at Mount Macedon), Bill was drafted into the 4th Division AIF, and left Australia as a member of the 8th General Service Reinforcement. In England, he was transferred to the Artillery, and on arrival at Le Harvre, France, was ordered to join the 111th Howitzer Battery. He served with this unit for the remainder of the war, and action took him to Northern France, including a spell in one of the most hard- fought campaigns around Villers-Bretonneux. He gained the rank of Artillery Sergeant. At the close of hostilities, he remained for a time as a member of the Australian Graves Detachment.

After three years service, Bill returned to civilian life and took up a university course, gaining the degree of Bachelor of Laws. He re-entered the teaching service and was appointed to various country schools, including Lavers Hill, where, in January 1929, he was licenced as VK3GA. On April 18, running 2.1 watts input from a dry battery, he made his first amateur radio contact, with VK3PP Captain Payne, Patron of the WIA. This was the first of some 16 000 contacts which Bill was to make in the following years. His QSL card, of novel design at that time, depicted the now familiar boomerang with the words, "Comes back to you."

Lavers Hill was the scene of some unique public service. Test cricket was of intense interest in those days, and with the co-operation of the local postmistress, who was also the telephone operator, Bill relayed the cricket broadcasts direct from England to all subscribers in the district, Nothing could have made him more popular.

By 1934, Bill had gained a second university degree — Bachelor of Arts. War clouds loomed again. In 1940, after enlisting in the AIF, he transferred to the RAAF, becoming an Education Officer. 1943 saw him in New Guinea with 9 Operational Group, with service at Milne Bay, New Britain and Arawe.

Discharged in August 1945, he resumed teaching and became involved in the Victorian State Schools Sport Association. Amateur radio was re-activated. Bill's call was regularly heard on CW, and DX was the main interest.

An intensely active person, Bill was not only a keen gardener, amateur carpenter and decorator, but also an enthusiastic sportsman, his proficiency at tennis even when in his late 60s earning him considerable acclaim. Amateur radio claimed his quieter moments. Bill's shack, with its tiered display of cards was colorful, effective and impressive. Countries confirmed could be proved in a second. There were 286 of them.

This year a tower and four element beam had gone up behind the garden. Bill, now one of the oldest active VK amateurs, had hoped to extend his DX tally. Unfortunately, illness beset this modest veteran and he passed away on September 8, in his 87th year.

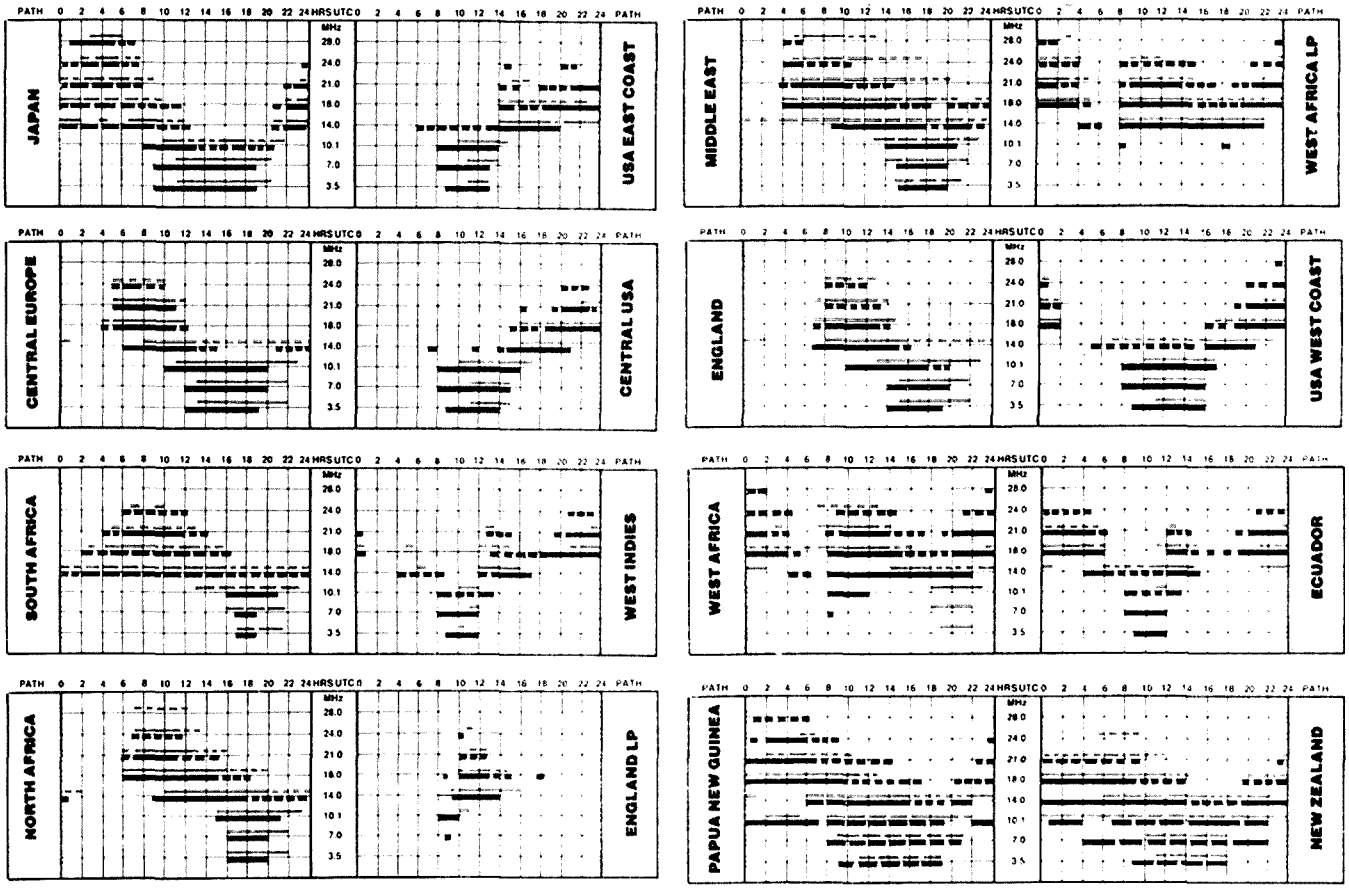
To his wife Lorna, his daughter and four sons, amateurs who remember Bill extend their kindest thoughts.

Ivor and Mavis Stafford VK3XB and VK3KS

ar

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND

From Western Australia (Perth)

From Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Solar Geophysical Summary

AUGUST

Solar activity continued to be low in August with no energetic solar flares observed.

A number of small regions were visible on the solar disc during the periods 01-09, 12, and 19-31. The small size of these regions is reflected by the daily 10 cm flux values for the month, peaking at 71 on the first with a low of 66 on 13th.

The regions observed were mostly 'reverse polarity' and the increasing presence of these regions indicates that the start of the new solar cycle is not too far away.

The 10 cm readings for the month were:
1=71, 2=70, 3=71, 4-7=70, 8-10=69, 11,12=67, 13=66, 14=67, 15,16=68, 17,18=67, 19=68, 20-22=69, 23,24=68, 25,26=69, 27-31=68.
Average was 68.65. Sunspot average was 7.4.

The running yearly average was 13.2 at February 1986.

GEOMAGNETIC

August was the most disturbed month since February 1986. There were three periods of disturbed conditions, the longest being 20-25th.

August 3,4 The field became disturbed early of 3rd and remained disturbed until the middle of the 4th. A=19,22.

August 20-25 The field became disturbed after 1500 UTC on 20th and remained that way until mid-25th. The most disturbed period was between 0300-0900 UTC on 22nd. A=16,27,24,26,19,19.

August 27 The field was disturbed between 0800-1400 UTC. A=18.

August 28-31 The field was disturbed from 1200 on 28th until 0600 UTC on 31st. The most disturbed period was 1800-2100 UTC on 30th. A=20,23,18.

—From data supplied by the *Department of Science IPS Radio and Space Services*, August 1986.

DEADLINE

All copy for inclusion in the February 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, January 2, 1987.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non- members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105x 220mm SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 1t Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

NEW 80 METRE CRYSTALS: Frequency 3.530 MHz tol 50 ppm, temp range -10 to +60 degrees C, stability 50 ppm, $18 per crystal including post. Mail orders to: ELECTRONIC APPLICATIONS, 6 Binnari Road, Hornsby Heights, NSW. 2077.

WANTED — NSW

COPIES ELECTRONICS AUSTRALIA: 1981 onwards. Cash adjustment. Reply VK2IS QTHR.

OLD SLAVE CLOCKS: of the type that were driven off master clocks in the head office of factories & govt buildings of yesterday. Slave units were stepped on by a pulse every 30 secs. Ray VK2FW. Ph:(063) 65 3410.

URGENTLY WANTED: for Swan Cygnet tcvr. Valve type 6JH8 (balanced modulator). VK2APL. Ph:(02) 457 9157.

VALVES: Two 3-500Z valves. Price & condition to VK2DNA, QTHR.

WANTED — VIC

ANY "RARE" RECORDINGS: of amateur radio contacts for Volume 2 of "The Sounds of Amateur Radio." We are particularly interested in recordings of contacts on Bands not now available to Australian amateurs, eg 112, 288 MHz, etc. We are also looking for recordings of unusual contacts, eg from Balloons, Aircraft, Submarines, etc. Any recording format can be handled from cylinders to CD. In the first instance please write to: Peter Wolfenden VK3KAU, c/- Federal Office, PO Box 300, Caulfield South, Vic. 3162. Please do not send recordings. Copies of Volume 1 "The Sounds of Amateur Radio" are still available for $7, plus post & packaging. Inquire at your Divisional Bookshop or the Federal Office.

DETAILS FROM CLUBS & GROUPS: about their formation & activities so they can be included in the Club Portrait series in AR magazine. Portraits already done on the NERG, GGREC & LFARG. Some brief details & contact name, plus phone number to Jim Linton VK3PC, QTHR.

HUSTLER MOBILE SUPER: resonators for 80 & 40 m. Iambic paddles, amateur orientated programs for Amstrad Disc & Microbee 32k computers & Icom IC-735 or IC-730. Must be in excellent condition. George VK3CGK, QTHR. PH:(03) 337 4903.

POWER PACK: for Icom ICBP-6, less batteries. Outside appearance unimportant. Reply in writing to: VK3RM, c/- Eliza Lodge, 347 Nepean Highway, Frankston, Vic. 3199.

RADIO CLUB: wants reasonable cost solid state 6m FM tcvrs (2) to complete repeater project to serve Melbourne area. Contact Kerry VK3KFC. Ph:(059) 96 3580.

WANTED — QLD

ANTENNA TUNING CAPACITORS: 200 pF single & dual section. Ceramic rotary switch 2-pole, 4-position. Ken VK4JPE, ex VK4TPE, QTHR. Ph:(079) 22 4985.

URGENTLY REQUIRED: instruction manual & circuit diagram for Yaesu FTDX-2000 linear. Will pay for copying & expenses. VK4FPO. Ph:(079) 27 1442.

ORIGINAL 110V POWER TRANSFORMER: for a Hallicrafter tx, model HT32 Mark 1. VK4KCF, QTHR. Ph:(07) 284 7739.

WANTED — SA

INSTRUCTION MANUAL or copy, or circuit diagram for Ten Tec 544 tcvr. Will pay for any expense incurred. Ph:(08) 271 0827.

FOR SALE — NSW

EIMAC 4CX 1500B: new in vacuum pack. $700. Socket to suit SK 800B & chimney SK 806. $400. Filament tranny included. Allan VK2AGR, QTHR. Ph:(044) 71 1059.

HF SIGNAL GENERATOR: AWA type 2-R7231. 92.7 kHz to 31.4 MHz with instruction manual. Very heavy — very stable. $250. No offers. Maurice VK2DFJ, QTHR. Ph:(02) 605 9127.

HY-GAIN TH6-DXX: 6 element beam. $450. Peter VK2CIM, QTHR. Ph:(060) 25 4066 AH. 25 1843.

ICOM IC-740: FM module fitted. WARC bands, PS-15 supply, hand-mic, desk-scanning mic. All as new Boxes & manuals. $990. VK2BPO, QTHR. Ph:(02) 713 1831 AH or (02) 568 2085 BH.

ICOM IC-R71A RX: fitted with FM, manuals, etc. Emtron ETP-1 ATU, microwave modules 2m GaAsFET & 6m converters. All mint condition. $900. Ph:(049) 69 4281.

KENWOOD TS-530S: with YK88CN CW filter fitted. Excellent condition in original packing with manual. $600. FT101E. AC & DC cords, mic, etc. Excellent condition. Still has plastic covering. $425. VK2ALM, QTHR. Ph:(065) 52 4411 BH or (065) 53 5353 AH.

VZ-200/300 RTTY/CW INTERFACE: adjustable 45-99 Baud, 170- 850 Hz shift, 5-99 WPM CW. Paperwork includes instructions, circuit, PCB layout, PCB & parts list, plus free software. Send $19.35 ($18 + $1.35 p&p) + good qual C10 cass to Rudy VK2FIM, 1-6 Ida Street, Charlestown, NSW. 2290. Ph:(049) 43 7548.

YAESU FT-757GX TCVR: with MH-1BB hand scan mic. $1100. FC- 757AT auto antenna tuner $375. Both as new, complete with manuals & cartons. Bruce VK2BDX, QTHR. Ph:(02) 624 3017.

FOR SALE — VIC

BENCHER PADDLE: in unopened carton. Never used. Surplus to requirements. $150. Roth Jones. Ph:(03) 870 3333 BH.

COMMODORE CBM 4016: with Commodore Tractor Printer 4022 2 Model. C2N Data Cassette, user guide, Pet/ CBM personal computer guide, RTTY/CW original software & other software. $450. Yaesu FT-107 with FC-107, FV-107 incl. IB-8 mic, instruction manuals, all in mint cond, in original cartons. $850. Icom IC-21A 2m FM. $135. Hans VK3DNS. Ph:(03) 555 8666, ext 17 BH.

CRYSTAL LOCKED AM HF BASE STATION: & mobile transceivers. Prices on application. Pat VK3ADN. Ph:(055) 96 2254.

FT-200 HF TCVR: with matching power supply & handbook. $200 or offer. VK3AQD, QTHR. Ph:(03) 459 6445.

TS-520S HF TCVR: $500. AT-200 antenna tuner $150. DG-5 digital display $150. Remote VFO 520 $175. Swiss quad 10m $100. Swiss quad 15m. $130. SP-520 external speaker. $50. MC-50 & MC-35 mics $100. 6m lattice tower with chimney strap & base $150. Diawa DR7600X rotator H/D $250. Siemans teletype $50. Or any offers. Rob VK3VOS, QTHR. Ph:(03) 366 3310.

PRINTERS: Honeywell 5X7 D/M 15 in Tractor F/D 1200 Bd RS232. GC. Decwriter 5X7 D/M 80 char tractor F/D 300 Bd RS232 on stand. EC. Both with keyboard. Best offers. Keith VK3AFI, QTHR. Ph:(052) 21 3658.

SHACK CONTENTS: Yaesu FTDX-401 tcvr, spare valves, Kenwood 9R59DS rx, SWR meter, electronic components. $500 the lot. Tony VK3DXS. Ph:(03) 725 8071.

TET HB-443DX: 4-band antenna, 4 element Yagi, has been strengthened as per AR article. Good condition. $480. Peter VK3QI, QTHR. Ph:(03) 29 6396 AH.

TRANSMITTING VALVES: all new in original cartons. 2 X 811A, 2 X 805, 4 X 807, 1 X 810, 4 X 6DQ5, 2 x Jumbo Sockets for 805, 2 X used 805. The lot for $125. Will not separate. Peter VK3APS, QTHR. Ph:(03) 836 7458.

YAESU FRG9600: VHF/UHF communications receiver. 10 months warranty. Complete with service manual. Mint condition. $1080. Rodney VK3UG, QTHR. Ph:(057) 62 1454 after 7 pm.

YAESU MUSEN ANTENNA TUNER FC-707: with Mobile Mounting Bracket. $200 ONO. Yaesu Musen VFO FV-107. $60 ONO. All phone calls returned. John VK3IC, QTHR. Ph:(03) 744 2506.

YOKOHAMA ELECTRIC: 0-260V 10A variac type adjustable auto- transformer. $100. Yaesu FL-2000B linear amplifier, 80-10 metres with pair 572B/T180 tx triodes in class B grounded grid configuration. What offers? VK3HC, QTHR. Ph:(03) 52 1808.

FOR SALE — QLD

AMATEUR RECEIVER: FRDX 400 160-10 with 2m & 6m modules plus CB band. 4 mech filters, pre selector tuning, squelch & rejection tuning. Includes matching speaker. $150 ONO. Ph:(07) 369 1706.

COMPLETE AMATEUR RADIO STATION: (ex VK4PB). Main equipment includes Drake SPR-4 rx (1971), Drake T-4XC tx (1973), Yaesu Linear Amplifier, Katsumi Electronic keyer, Diawa Speech Processor, Kenwood Dummy Load, & Osker SWR/Power Meter. Also included is a 75' ex-DCA tripod tower with a Hidaka Monobeam Antenna & rotor system (currently assembled to 60' & to be removed by purchaser). Many other items are also included. Would prefer to sell as a complete package for $2000. Contact Mark Littleboy. Ph: 377 9541 BH or 379 1992 AH.

KENWOOD TS-520 TCVR: very good condition. No mods, manuals mic & leads. $470 ONO. VK4WR, QTHR. Ph:(071) 41 1315.

PHILIPS 828 MK 11: Currently working on 2m. Has remote control board & provision for 10 channels. Ideal start for a repeater. Would consider a swap for another 2m rig. Richard Burden, VK4FKB. Ph:(079) 83 2871.

SWAN SW-240: complete with power supply, manual & circuit diagrams for both units. Ex-deceased estate. $240 ONO. VK4FPO. Ph:(079) 27 1442.

FOR SALE — TAS

COMMUNICATIONS RECEIVER: Yaesu FRG-8800. Latest model, only 4 months old. This is the full coverage version, not limited to 2-30 MHz. New condition, with original packing & manual. Being sold due to purchase of IC-735 tcvr which has its own general coverage rx. Current new price for FRG-8800 full coverage model is $1259; asking $950 for this one. Also have FRV-8800 VHF converter, FRT-7700 antenna coupler & FIF-232C computer interface to sell by negotiation. Icom IC-730 HF tcvr. As new condition, with original packing & manual, now replaced by latest IC-735. Very small, good for base, portable, or mobile use. A really lovely rig to operate; has a particularly hot receiver with a mechanical filter. Tx 100W output, internally switchable to 50W for novice use. Comes with optional input/output interface & Yaesu noise-cancelling mic. Asking $750. Tom VK7TM, QTHR. Ph:(002) 39 1391.

ICOM IC-490A UHF MULTI-MODE TCVR: New idea/UHF repeaters & satellite operations. $700. Yaesu FV-101DM scanning ext VFO. New, suits FT- 101ZD Mk3. $165. VK7AN, QTHR. Ph:(003) 31 7914.

Advertiser's Index

SYDNEY — MELBOURNE — BRISBANE

$99 CHRISTMAS BONUS

Yes this new from EMTRON — highly accurate CROSS-NEEDLE SWR & POWER Meter, model EP-200 worth $99, comes ABSOLUTELY FREE with every KENWOOD or ICOM HF transceiver such as:
TS-940S, TS440S, IC-735, IC-751

We offer BEST PRICES in Australia on all KENWOOD Products!!

EMTRON PRODUCTS:

ANTENNA TUNER - EAT 300A
The finest 300 watt ant. tuner on the market with cross needle swr/power meter, built-in dummy load and 6 pos antenna switch. **$329**

ANTENNA TUNER-EAT 300
Same as EAT-300A but with SWR meter only and without dummy load and antenna switch. Only **$209**

ETP-1 THE SWL DELIGHT!
This antenna tuner & low noise pre-amplifier for receivers designed with SWL in mind, will boost weak signals and match your antenna to the receiver for best performance. **$159**

EAA 130 ACTIVE ANTENNA
For SWL. Out perform all other antennas except beams, ideal for any space small or large. **$199.**

NEW ENB-2 BEST NOISE BRIDGE
On the market and most accurate, with built-in expander. Only **$129**

DAIWA

CS-401 4 pos, coax switch	$149
CS-4 4 pos, coax switch	$69
CS-401G 4 pos, coax switch	$189
CS-201G 2 pos, coax switch	$89
NS-660P	$259
LA-2080 H AM-AMP	$350
CN-540 SWR/Power meter	$139
CN-410M SWR/Power meter	$139
CN-460M SWR/Power meter	$139

WELTZ

SP-600 SWR/P 1.6-500 MHz	$299
SP-225 SWR/P 1.8-200 MHz	$259
SP-220 SWR/P 1.8-200 MHz	$139
SP-122 SWR/P 1.6-60 MHz	$199
SP-425 SWR/P 140-525 MHz	$259
SP-420 SWR/P 140-525 MHz	$165
SP-662	$249
SP-250 SWR/P 1.6-60 MHz	$129
SP-45M SWR/P 140-470 MHz	$129
CT-15A&N 50W Dummy Loads	$49
CT-20G 2.5 GHz Dummy Loads	$149
CT-300 250 MHz Dummy Loads	$159
CH-20A&N Coax Switches	$59&$99
TP-05X 50/144/430 MHz P Meter	$49
CC-50N 100-1300 MHz C. Coupler	$89

RECEIVERS:

Kenwood R2000	$699
Kenwood R5000	$1290
Yaesu FRG 8800	$1190
JRC NRD525	$2299
AR2002 scanned	$899

DATONG PRODUCTS

D70 morse TUTOR 12	$179
ASP automatic speech processor	$...
RFA RF pre-amplifier	$...
FL3 automatic HF filter	$...
SRB-2 Woodpecker Blanket	$...
VLF converter	$...

POWER SUPPLIES

Alinco EP 3030 30A	$599
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